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ABSTRACT

Seventy postsecondary programs that use one or more telecommunications technologies to serve learners are described, and current patterns and trends, and projections about future problems and possibilities, are discussed. The purpose of the guide is to encourage educators to focus attention on the educational problem before considering which, if any, electronic technology is appropriate. There is an emphasis on technological applications that address the educational needs of learners rather than administrative needs. In addition, programs that have a capacity to serve off-campus as well as on-campus students are emphasized. The guide is broad in scope, including most types of postsecondary organizations (i.e., colleges, universities, vocational/technical institutes, libraries, hospitals, professional associations); all forms of telecommunications technologies (audio, video, computer); and all educational levels (basic skills, undergraduate, graduate, professional, and adult continuing education). Additional contents include: highlights of each program; charts describing the educational missions and telecommunications technologies of different types of organizations; a glossary of technical terms; and index listings, which include organizations, programs, states, and academic subjects. (SW)

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MEETING LEARNERS' NEEDS
THROUGH TELECOMMUNICATIONS:

A DIRECTORY AND
GUIDE TO PROGRAMS

# TELECOMMUNICATIONS

By Raymond J. Lewis
Center for Learning and
Telecommunications

The Center is a program of the American Association for Higher Education (AAHE) and is supported by the Carnegie Corporation of New York.

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TO THE MEMORY OF MY FATHER

# FOREWORD

During the 50's, 60's, and 70's, we learned to wince at the periodic—and false—proclamations that technology was about to revolutionize higher education. But now the 80's have arrived, and we are waking up to the fact that *it's really happening*, this decade *is* going to be different. Cable television, telephones, computers, radios, videotext are all being used to offer higher education in new ways. Our old images have to adjust to the new reality of having Mark Hopkins on one end of the log and a TV screen on the other.

Raymond Lewis and Marilyn Kressel were among the relatively few people who saw all this coming. As a program officer with the Fund for the Improvement of Postsecondary Education, Ray had a marvelous window for looking out onto the programs colleges, universities, and other agencies were developing around new technologies for communication and data handling. As a staff director for a project to bring community college leaders together with managers of broadcast stations, Marilyn had watched how the sector most aggressively involved in utilizing technology had wrestled with the first generation of problems.

By the spring of 1980, both had seen enough to be impressed with technology's tremendous potential, as well as to start worrying about several things. Worry #1 was that means would drive ends—that the technologies higher education had in hand would drive the choices of purpose and clients served rather than the other way around. Worry #2 was that higher education seemed to be preoccupied with one kind of program—offering "telecourses" over broadcast TV—when in fact there were many combinations of technologies, including low cost ones such as telephone and radio, which deserved equal attention. Worry #3 was that there didn't seem to be a place where people could turn for an unbiased view of what the menu of possibilities really was.

One conversation led to another, and soon we were talking to the Carnegie Corporation of New York. Carnegie also saw the need to provide better information to those developing new programs. The upshot was that AAHE became the sponsor of a new Carnegie-supported service—the Center for Learning and Telecommunications. AAHE was considered a good base of operation because, as an association of individuals from all positions and sectors of higher education and beyond, we didn't have an axe to grind for any particular position or point of view.

In July 1980, we officially started up the Center at AAHE's national office with Marilyn as Director. She and others on the central staff took on the task of inventorying needs and of monitoring specialized literature, important events, conferences, workshops, and other activities, and reporting all this through *TELESCAN*, the Center's newsletter. Ray took on the assignment of mapping the terrain of what programs were actually in place in the field.

This Guide/Directory is a report on Ray's two-year investigation. He has uncovered an impressive variety of programs, and presents them in a way that gives the reader all sorts of options. You can read about patterns of development in the guide, skim through the directory section, and/or mine program descriptions in detail.

We are proud to issue Ray's report as an Association publication. It is "must browsing" for all, and warrants careful reading by those who really want to understand what's happening to higher education in the 1980's.

Russell Edgerton
President
American Association for Higher Education

# PREFACE

The focus of this book is on current educational applications of telecommunications technologies by postsecondary organizations. It is intended as a resource for people interested in the topic, regardless of their level of prior experience with education beyond high school or with audio, video or computer technologies. The book's purpose is to increase the likelihood that when educators use telecommunications technologies to solve educational problems, they will be more aware of the practices of other organizations. Its purpose is also to encourage educators to focus their attention on the educational problem before considering which, if any, electronic technology is appropriate to the problem. It does this by providing, in layman's language, a broad overview of current practice as well as detailed information about numerous specific programs.

The scope of this book has been broadly conceived to include most types of postsecondary organizations (colleges, universities, vocational/technical institutes, libraries, hospitals, professional associations, etc.), all forms of telecommunications technologies (audio, video, computer), all types of educational services (credit and noncredit instruction, information and counseling, public service programming), and all levels of postsecondary instruction (basic skills, undergraduate, graduate, professional and adult continuing education). Although the book encompasses all these elements, there is a specific emphasis on technological applications that address the educational needs of learners rather than the administrative needs of postsecondary organizations. There is also an emphasis on programs that have a capacity to serve students in off-campus, as well as on-campus, settings.

The book, which is based on an in-depth survey of 70 programs, is divided into three sections. Part I introduces Parts II and III. Part II, The Guide to Programs, describes current patterns and trends, and speculates about future problems and possibilities. Part III, The Directory of Programs, contains detailed descriptions of 70 postsecondary programs that use one or more telecommunications technologies to serve learners.

A number of features have been incorporated into the book to assist readers in making effective use of the information, regardless of their level of prior experience with the subject.

They include:

- chapter summaries in Part II
- program descriptions in Part III that include comparable information
- highlights of each program in Part III listed in the third column
- charts in Part III describing different types of postsecondary organizations in terms of their educational missions and telecommunications technologies
- glossary of technical terms
- index listings which include organizations, programs, states and academic subjects

I am very pleased that I was able to include as many as 70 programs in the survey. However, I wish to apologize ahead of time to those associated with the many significant educational programs not included in The Directory of Programs. Some programs did not fit the survey selection criteria (see Appendix A) and others did not come to my attention until after the survey was completed. In the effort to portray the diversity of this postsecondary/telecommunications field, it was sometimes necessary to limit the number of programs appearing in any single category. The Center for Learning and Telecommunications is continuing to gather information about programs other than those included in this book. I encourage readers to send information about programs with which they are familiar in order that the Center might inform others about these activities.

Raymond J. Lewis
Research Director
Center for Learning and Telecommunications

# ACKNOWLEDGEMENTS

It has taken the time, energy and good will of many people to produce this book. They have contributed in a variety of ways at each stage in the process: identifying postsecondary programs that use telecommunications technologies, shaping the survey instrument, interviewing program staff, responding to interview questions, reviewing program descriptions, reviewing draft versions of the Guide to Programs, typing, editing, designing, typesetting and printing.

This entire process would not have been possible if Alden Dunham and the staff of the Carnegie Corporation of New York had not been convinced of the need to provide postsecondary educators with some kind of "road map" to current applications of telecommunications technologies. I am most grateful to Alden Dunham, Karin Egan and their colleagues for providing the funding support to make possible both this book and the Center for Learning and Telecommunications.

In the absence of a comprehensive list of programs, during the early stages of this inquiry considerable effort went into identifying postsecondary organizations with programs that use telecommunications technologies. Among the many people who provided invaluable assistance in this process were: Marcia Baird (University of Wisconsin-Extension), Randall Bretz (University of Nebraska), Brian Brightly (National Public Radio), Nancy Corder (West Virginia Wesleyan College), Robert Cowan (Research Medical Center, Kansas City, Missouri), Martin Elton (New York University), John Fitch (Association for Media-Based Continuing Education for Engineers), Karen Heald (Benton Foundation), Dale Heckman (California Postsecondary Coordinating Commission), Richard Johnson (Exxon Education Foundation), Karen Kearns (National Public Radio), Christine Olgren (University of Wisconsin-Extension), Rodger Pool (Dallas County Community College District), Gail Reed (Association for Media-Based Continuing Education for Engineers), Jean Rice (Rice Associates), and Milan Wall (Wall and Associates.)

Members of the Advisory Committee of the Center for Learning and Telecommunications (listed on this page) not only assisted in identifying programs, but also helped shape the survey questionnaire and review various draft versions of the book. I am very grateful for their many contributions.

Gathering so much information about each of 70 programs would have been impossible without the willing cooperation of the staff members of these programs. At each program, one or more of the staff spent hours responding to interview questions and then afterward reviewing written descriptions for accuracy. In addition, many helped identify other programs for possible inclusion in the study. The photographs appearing in this book are also part of their contribution. I am deeply indebted to them for their assistance.

I am grateful for the substantial contribution made by Mary Kinnick (Kinnick and Associates) to the process conducting interviews and writing program descriptions. I am also grateful to Paul Franklin (Harrisburg Associates) and James Meier (independent consultant) for their contributions to this process.

As The Guide to Programs (Part II of this book) went through its draft stages, many individuals took time from busy schedules to read parts of it and make comments. I am extremely grateful for their assistance and only hope the final product, for which I take full responsibility, adequately reflects their suggestions. They include: Peter Dirr (Corporation for Public Broadcasting), Russell Edgerton (American Association for Higher Education), Charles Feasley (Oklahoma State University), Paul Franklin (Harrisburg Associates), Russell Garth (U.S. Department of Education), David Horgan (University of Maryland), William Kinder (Academy for Educational Development), Mary Kinnick (Kinnick and Associates), Linda Lewis (Abt Associates), Ted Marchese (American Association for Higher Education), John McVeigh (Federal Communications Commission), David Rosen (WNET/Channel 13), Martin Siegel (University of Illinois) and Andrew Zucker (U.S. Department of Education).

I would also like to thank Tony W. Bates of the British Open University for helping me clarify some aspects of my scheme for describing the technologies.

Because this book is intended for readers with a wide range of information needs, considerable effort has gone into making it easy to use. If we have succeded in this effort, much of

## ADVISORY COMMITTEE

The following individuals have served in an advisory capacity to the Center for Learning and Telecommunications during different periods of its existence.

**Jay Barton,** President
University of Alaska

**Charles Bowen,** Director
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IBM Corporation

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**Sister Joel Read,** President
Alverno College

**Elizabeth Young,** President
Public Service Satellite Consortium

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Throughout this long process I have benefited from the professional advice, moral support and gentle prodding of Russell Edgerton, President of the American Association for Higher Education and Marilyn Kressel, Director of the Center for Learning and Telecommunications. In addition, Karen Sibert and Heidi Kenega of the Center's staff have contributed in many ways to the support of this effort. Both Bethany Dalton and Sue Ayers deserve a well-earned vote of thanks for providing such reliable typing assistance.

From the inception of the study to the completion of the book, Peter Dirr of the Corporation for Public Broadcasting has made many important contributions. His commitment to systematic inquiry in this field has both inspired and challenged my own expectations for this book. I am deeply indebted to him for the many constructive suggestions he made along the way.

An undertaking of this magnitude is not easily contained within the confines of an office. It has a way of spilling over into many aspects of the author's life. In addition to doing the initial editing of the program descriptions, my wife, Liza Mickle, has lived with this book throughout its evolution. My appreciation for her sound advice and unfailing support is probably only matched by her relief at seeing it completed.

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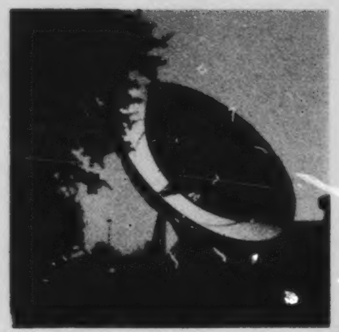
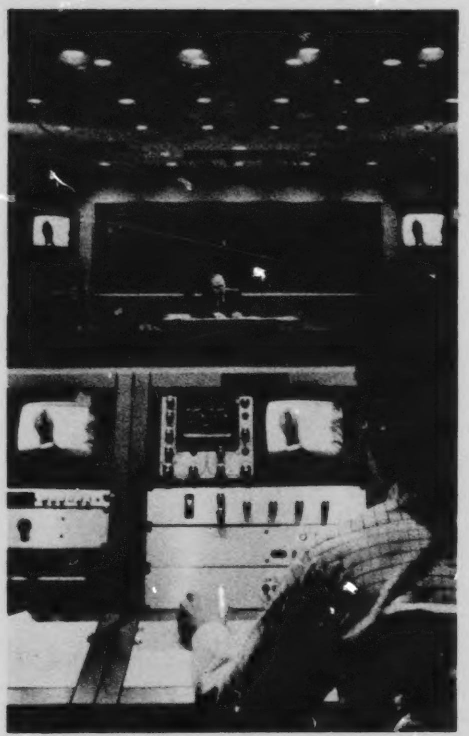
# 1

# INTRODUCTION TO THE GUIDE AND THE DIRECTORY

# INTRODUCTION TO THE GUIDE AND THE DIRECTORY



Satellite earth station
-The Association for Higher Education of North Texas (AHE)



Live interactive video instruction conducted on campus and transmitted to industry sites
-The Association for Higher Education of North Texas (AHE)

It is hardly news to consumers that technological advances in the telecommunications industry are changing the world in which we live. Daily we are barraged with advertisements urging us to buy electronic games, home computers, video cassette recorders, video cameras, videodisc players, portable telephones and even satellite dishes. We are told that soon we will be banking, shopping, and making airplane reservations with the aid of home computers and 100-channel cable television systems.

Many of the same technological developments are also dramatically influencing postsecondary education, yet it is not easy for educators to learn how these changes are affecting current practice in their own profession. Without some assistance it is very difficult for the nontechnical educator to assess their significance. The purpose of this book is to provide people interested in postsecondary education with resources to help them assess the impact of these changes on current practice and their implications for the future.

If we think of postsecondary education and the telecommunications industry as two separate circles which intersect with an area of overlap between them, then the focus of this book is on the overlapping area common to both.[1] Admittedly, the majority of activities in each of these fields are largely unaffected by developments in the other. In the past ten to fifteen years, though, the interaction between the two has become so extensive that the area of overlapping activities has expanded dramatically.[2]

## Developments in Postsecondary Education and the Telecommunications Industry

This increased interaction is a consequence of important developments in both fields. **Developments in the postsecondary education include:**

- an "access revolution" has expanded and diversified the learner clientele colleges and universities are committed to serve
- changing demographic patterns have forced many colleges and universities to pursue alternative clientele and instructional missions
- the rising average age of college students

and the increased proportion of part-time working adult students has prompted educators to look for more flexible and convenient modes of delivering instruction to people with busy schedules

- the combined effects of inflation, recession, the energy crisis, and severe budget constraints motivate many postsecondary educators to explore more cost-effective ways of managing organizations and serving learners

**Developments in the telecommunications industry include:**

- continued refinement of "mature" technologies—telephone, radio, television, and computers—has made them more portable and accessible
- the availability of newer modes of communication has been vastly expanded by the recent proliferation of technologies such as the video cassette, the videodisc, interactive cable television, the electronic blackboard, and satellite-to-cable networks
- some technologies are becoming increasingly affordable because, in relative terms, their costs are declining
- telecommunications professionals are increasingly motivated to focus on the income potential of educational programming. A combination of factors account for this phenomenon: the expanding home computer market, industry deregulation, cuts in federal funding for public television and radio, and creation of the $150 million Corporation for Public Broadcasting/Annenberg School of Communications Project to fund the development of college level video and audio instructional materials.

## Evidence of Technological Impact on Postsecondary Education

These and other developments in the two fields have already significantly affected the delivery of educational services. For example:

- a 1979 survey of 2,993 colleges and universities found that 61 percent used television for instruction and that approximately 498,000 students were enrolled in television courses[3]
- in its first year of operation the Public Broadcasting Service's Adult Learning Programming Service enrolled over 55,000 students at 555 colleges and universities
- in 1981-1982, the Appalachian Community Service Network (ACSN) made it possible for more than 3,000 students to enroll in credit courses at 70 colleges and universities in the United States
- numerous local, state, regional, and national educational consortia have been formed; collectively they now develop and distribute telecommunications programming to thousands of students
- at institutions like MIT and Johns Hopkins University, 25-50 percent of the freshman are arriving with their own microcomputers
- computers have been integrated into virtually every aspect of postsecondary educational curricula and, in contrast with past behavior, many faculty are now requesting opportunities for computer literacy training
- at least ten states have established statewide educational audio teleconferencing networks, providing instruction to thousands of students annually
- in 1982, 68 colleges and universities established a National University Teleconference Network; it cooperatively offers video and audio teleconferences on a nationwide basis
- Services by Satellite, Inc., a subsidiary of the Public Service Satellite Consortium, anticipates that its Campus Conference Network will be operational in 1983, making it possible for colleges and universities to sponsor and participate in video teleconferencing on a nationwide basis
- each year hundreds of thousands of professionals (legal, medical, engineering, high technology, etc.) receive continuing education offered by postsecondary organizations through telecommunications technologies

## The Need for Better Information

The explosion of telecommunications activity in postsecondary education has been accompanied by an outpouring of information on the subject. Every newspaper and journal in the country read by educators has covered some aspect of the story. Numerous workshops, conferences, and research reports have also focused attention on the

Computer-assisted instruction
*Baltimore Mayor's Office of Manpower Resources*

topic. In spite of the high quality of some of this information, taken as a whole it fails to provide the broad perspective and systematic treatment that many nontechnically oriented educators need if they are to better understand how telecommunications activities translate into actual practice.

To respond to this need, the staff of the Center for Learning and Telecommunications, aided by the Center's Advisory Committee, concluded that the Center should conduct a survey of educational programs using telecommunications technologies and publish the results in a manner that avoided as many of the limitations as possible of existing information on the topic. We concluded that:

- the Center's publication should be easily understood by the layman
- the publication should include *all* telecommunications technologies currently in use by postsecondary programs that fit the survey selection criteria
- the publication should be open to *any* educational approach to using electronic media to provide educational services at the undergraduate, graduate, professional, or adult continuing education level
- it should use consistent categories to make the information as comparable as possible
- it should provide accurate, detailed information on current practices of postsecondary organizations
- it should include programs selected on the basis of explicitly stated criteria
- the publication should concentrate on current practice
- it should describe current practice in a neutral nonadvocacy fashion

## A Road Map of the Postsecondary/ Telecommunications Field

This resulting book, then, may be seen as a road map to this postsecondary/telecommunications field. Its intent is to meet the information needs of people with widely varying responsibilities and levels of prior experience.

It was clear from the outset that the survey could not include all educational programs using telecommunications technologies. In the same way that road maps do not portray every detail, this book is not a perfect representation of reality. Nevertheless, because of its selection criteria and the overall methodology,[4] the reader will find in this book many of the most prominent landmarks, plus some lesser known but significant programs. The book includes both a *directory* of 70 individual program descriptions and a *guide* that portrays patterns and trends that emerge from an analysis of the 70 programs. This book is organized so that the reader may make a quick trip through it focusing only on the highlights, take numerous excursions into specific programs and program elements, or explore the territory in its entirety.

## A Closer Look at the Survey

The focus of the survey was narrowed by logical and practical considerations. Despite a wealth of experience in the educational application of telecommunications technologies to be found in Europe, Canada, and other countries, and in the military and industrial sectors of our society, the focus of the survey was limited to postsecondary organizations in the United States.

The survey was also limited to programs with educational delivery systems that included print media and student support services, as well as electronic media. It was also restricted to programs that had a capacity to serve learners off campus as well as on campus.[5]

Despite these limitations, special efforts were made to make the survey as representative as possible of the variety of postsecondary organizations, technologies, educational missions, student clientele, and geographical areas involved in the postsecondary/telecommunications field. The breadth of the survey's coverage is complemented by the detailed level of information included in each of the 70 program descriptions. The following 16 categories of information were used to characterize each program:

Organization
Telecommunications Program (sometimes the same as organization)
Educational Mission
Telecommunications Technology
Curriculum
Faculty Roles
Delivery System
Enrollment
Administrative Structure
Finances
Noteworthy Features
Problems Encountered
Observations about Distance Learning
Future Plans
Resources Available
Contact Person

The scope of the survey contemplated a broader range of technologies than was actually found currently being used to serve learners. For example, we found no programs fitting our criteria that used videodisc or videotex, although some educators are experimenting with these technologies.

The survey design also looked for programs offering educational services other than formal instruction. We found programs offering public service programming and counseling, information, and referral services. Only one program did not also offer formal instruction.

Some programs included in the survey have gone through major changes or have even stopped operating. They are included in the book to give the reader an appreciation for the volatile nature of the field and to highlight lessons from their experience. An indication of the current status of these programs is included in the individual program descriptions found in Part III of this book. It is my hope that the combination of the Guide to Programs (Part II) and the Directory of Programs (Part III) will, like a road map, provide the reader with the resources to explore those aspects of the postsecondary/telecommunications field that are of most interest.

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[1] The definitions of postsecondary education and telecommunications used throughout this book are intentionally broad in scope. The term postsecondary education refers to all education beyond high school whether provided by colleges, universities, or other organizations in the community. The terms telecommunications technology, electronic media, and communications technologies are used to refer to communication over distance using various electronic means such as television, radio, telephone and computers. Copy technologies such as videotape and audiotape also are included in this definition.

[2] The term postsecondary/telecommunications field will be used to represent the activities that overlap these two sectors of our society.

[3] Peter J. Dirr, Joan H. Katz, and Ronald J. Pedone, *Higher Education Utilization Study, Phase I: Final Report.* Washington, DC: Corporation for Public Broadcasting, 1981, p. 3.

[4] A description of the survey methodology is included in Appendix A.

[5] The rationale for the emphasis on a capacity to serve learners off campus is included in Appendix B.

# 2

# GUIDE TO PROGRAMS

This Guide to Programs presents an overview of some of the patterns and trends that emerge from an analysis of the 70 program descriptions included in Part III of this book. Because it is written by one person, it is, by definition, a personal view. It is based on experience gained from searching available literature, interviewing program staffs, writing more than 50 program descriptions, and conducting an analysis of all 70 programs. This Guide represents a continuation of one educator's efforts to understand the nature and extent of the impact that the use of telecommunications technologies is having on postsecondary education.

Someone else looking at the same landscape from another viewpoint may see different patterns and trends. Nevertheless, it is my hope that this Guide to Programs will assist readers in their own efforts to gain perspective on the postsecondary/telecommunications field.

The organization of this Guide to Programs closely parallels the major categories found in each of the 70 program descriptions:

Organization
Educational Mission
Telecommunication Technologies
Curriculum
Faculty Roles
Delivery System
Finance and Enrollment

The final section, "Beyond Current Practice: Problems and Possibilities," includes some of my own comments and concerns about long-term developments in this field.

# 1. ORGANIZATIONS

**What type of postsecondary organizations are sponsoring programs that use telecommunications technologies to serve learners?**

Not surprisingly, colleges and universities constitute the majority of the postsecondary organizations employing electronic media to serve learners. However, formal educational institutions do not have a monopoly in the use of these technologies. Also included in the survey are other organizations such as consortia, broadcast facilities, government agencies, professional associations, nonprofit organizations, and a community-based organization. In addition, some of the formal and informal collaborative arrangements in which the surveyed organizations participate involve public school systems, libraries, community organizations, cable companies, publishers, unions, businesses, and industries. The types of organizations surveyed are summarized in table 1.

**Table 1. Types of Organizations Surveyed**

| Organizations | Number | Percent |
|---|---|---|
| Two-year colleges | 14 | 20 |
| Four-year colleges and universities | 28 | 40 |
| Consortia (local and state) | 8 | 11 |
| Consortia (regional and national) | 6 | 9 |
| Broadcast facilities | 5 | 7 |
| Community-based organization | 1 | 1 |
| Government agencies | 2 | 3 |
| Professional associations | 2 | 3 |
| Nonprofit organizations | 4 | 6 |
| Total | 70 | 100 |

Viewing videotape course at a worksite
Association for Media-Based Continuing Education for Engineers, Inc. (AMCEE)

## Comparing the surveyed organizations with the universe of colleges and universities

The 70 surveyed programs and their sponsoring organizations do not constitute a structured or random sample of the universe of organizations using electronic media. The information necessary to construct such a sample currently is not available. Nevertheless, when the colleges and universities included in the survey—both individual institutions and members of consortia—are compared with the universe of all institutions in the United States, they appear very similar (see table 2).

When adjustments are made for those institutions that belong to more than one consortia, the percentages of two-year and four-year institutions sponsoring telecommunications programs resemble quite closely those in the universe. According to the National Center for Educational Statistics *Educational Directory, Colleges and Universities 1980-81*, two-year colleges account for 39.4 percent of the institutions, and four-year institutions make up the other 60.6 percent. Comparable figures for the survey are 43.1 percent and 56.9 percent, respectively. Thus, the survey includes slightly more two-year and slightly fewer four-year colleges than the universe. Unfortunately, we have no way of making a similar comparison between other types of postsecondary organizations (e.g., nonprofit organizations, professional associations) that sponsor telecommunications programs.

Even though the 385 separate colleges and universities represented in the survey (individual institutions plus consortium members) constitute only 12 percent of the 3,270 educational institutions in the United States, we can feel more confident about any observations or conclusions growing out of this inquiry knowing that the proportion of two-year to four-year institutions so closely resembles the universe of institutions.[1] Of course, we have no way of knowing whether the population of colleges and universities that use electronic media to serve students differs substantially from the universe of all institutions.

**Table 2. Colleges and Universities in the Survey**

| | 2-year | 4-year | Total |
|---|---|---|---|
| Consortium institutions | 165 | 206 | 371 |
| Consortium institutions minus overlap[a] | 152 | 192 | 344 |
| Individual institutions (included in the survey) | 14 | 27[b] | 41 |
| Total number of institutions included in the survey (minus overlap) | 166 | 219 | 385 |
| Percentages of institutions in the survey | 43.1% | 56.9% | 100% |
| Percentages of institutions in the universe of colleges and universities[c] | 39.4% | 60.6% | 100% |

---

[a] This category excludes institutions that belong to two or more consortia and institutions included in the survey that also belong to one of the surveyed consortia.

[b] The University of Illinois accounts for two of the 70 programs, thus reducing the number of four-year institutions by one.

[c] Based on figures in the National Center for Educational Statistics, *Education Directory, Colleges and Universities 1980-81*.

## Collaborative Efforts

One of the most striking trends associated with the use of telecommunications technologies by educators is the extent of formal and informal collaboration among educational institutions. The composition of the individual consortia included in the survey and the extent of their activities testify to the capacity of the electronic media to stimulate cooperation among postsecondary organizations. Table 3 presents information on the consortia included in the survey.

All the surveyed consortia are specialized organizations created to share the costs and benefits of using telecommunications to reach learners. Because most communications technologies have the capacity to reach far beyond the traditional service areas of individual educational institutions, the incentives for cooperation can be very compelling. In some cases, but certainly not all, collaboration begun only for the purpose of sharing telecommunications resources has led to the identification of other mutual interests among consortial members and to further cooperation. Some functions performed by surveyed consortia which benefit individual member institutions include:

- leasing or purchasing electronic and print instructional materials
- producing electronic and print instructional materials
- using telecommunications facilities and air time
- promoting and marketing of educational programming
- raising funds and sharing resources
- providing reciprocal registration arrangements among consortium members
- conducting faculty and staff development activities

## Sponsoring organizations and their telecommunications programs

A variety of patterns emerge from an examination of the relationships between sponsoring organizations and the telecommunications programs that actually provide services to learners. In some cases the sponsoring organization's only mission is to employ electronic media to provide educational services. More often a separate program within a larger sponsoring organization has this responsibility. In other cases two organizations cooperatively sponsor a telecommunications program and in still other situations two or more organizational units within a single sponsoring organization share the responsibility for a telecommunications program. Consortia, state agencies, and broadcast facilities are among the sponsoring organizations that account for the varying patterns among the surveyed programs. Table 4 provides examples of some of these relationships.

**Table 3. Surveyed Consortia**

| | **Type of Institutional Members** | | |
|---|---|---|---|
| | *Two-Year Colleges* | *Four-Year Colleges and Universities* | *Number of Members* |
| **Consortia (Local and State)** | | | |
| Association for Higher Education of North Texas (TAGER) | 1 | 16 | 17 |
| Bay Area Community College Television Consortium | 24 | | 24 |
| Cable Advisory Board for Learning and Education (CABLE)[a] | 1 | 6 | 7 |
| Cablearn—Seattle[b] | 7 | 4 | 11 |
| Indiana Higher Education Telecommunication System (IHETS)[c] | 15 | 59 | 74 |
| Kansas Regents Continuing Education Network (TELENET) | | 6 | 6 |
| Kentucky Council on Higher Education—Telecommunications Consortium | 13 | 28 | 41 |
| Maryland Center for Public Broadcasting—College of Air[d] | 14 | 5 | 19 |
| San Diego and Imperial Counties Community College Association—TV College[e] | 9 | 4 | 13 |
| Southern California Consortium for Community College Television | 36 | | 36 |
| Subtotal | 120 | 128 | 248 |
| **Consortia (Regional and National)** | | | |
| Association for Media-Based Continuing Education for Engineers (AMCEE) | | 20 | 20 |
| Eastern Educational Consortium (EEC) | 30 | 17 | 47 |
| National Univeristy Consortium (NUC) | | 15 | 15 |
| Philadelphia Community College—Community College at Home Project[f] | 12 | | 12 |
| To Educate the People Consortium (TEP)[g] | 3 | 15 | 18 |
| University of Mid-America (UMA) | | 11 | 11 |
| Subtotal | 45 | 78 | 123 |
| Total[h] | 165 | 206 | 371 |

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[a] CABLE also includes public and parochial schools and the public library system.

[b] The Cablearn consortium is included in the description of the University of Washington, fiscal agent for the consortium.

[c] This figure includes some colleges and universities that are members of IHETS but are not yet connected to the statewide video network.

[d] Although not legally a consortium, the Maryland Center's College of the Air operates very much like one and, therefore, is included here.

[e] Four universities are affiliated members of TV College.

[f] All members of this informal consortium are also members of the Eastern Educational Consortium.

[g] More than 30 institutions are members of TEP, but only 18 whose programs are currently operational are included here.

[h] This total does not take into account overlapping memberships. See table 2 for this figure.

## Table 4. Examples of the Relationships Between Sponsoring Organizations and Telecommunications Programs[a]

- Sponsoring organization with telecommunications as its exclusive activity
  - *Examples:* Appalachian Community Service Network (ACSN)
  - Indiana Higher Education Telecommunication System (IHETS)
- College or university with a single program responsible for telecommunications programming
  - *Examples:* Milwaukee Area Technical College
  - College of Great Falls
- College or university with two or more organizational units responsible for telecommunications programming
  - *Examples:* Kirkwood Community College—the Office of Telecommunications and the Office of Non-Traditional Studies
  - University of Minnesota—the Department of Independent Study and University Media Resources
- College or university with two or more organizationally distinct telecommunications programs
  - *Examples:* Colorado State University—Engineering Renewal and Growth Program (ERG) and State University Resources in Education (SURGE)
  - University of Illinois—PLATO Corrections Project and Electronic Blackboard Communication System
- College or university system in which a single institution has responsibility for providing telecommunications programming for an entire multicampus system
  - *Examples:* City-Wide College of the City Colleges of Chicago
  - Rio Salado Community College of Maricopa Community College District
- College or university that has sufficiently integrated telecommunications programming into its normal academic activities so that no separate organizational unit exists
  - *Examples:* Central Piedmont Community College
  - West Virginia College of Graduate Studies
- Two different organizations working as a team with shared responsibility for telecommunications programming
  - *Examples:* University of South Carolina and the South Carolina Educational Television Commission
  - Berks Community Television and ATC Berks Cable Television Company
- Consortium with its own legal identity that supports the telecommunications programming of its member organizations
  - *Examples:* Southern California Consortium for Community College Television
  - To Educate the People Consortium
- State agency that coordinates a statewide service among programs at individual colleges and universities in the state
  - *Examples:* Kentucky Council on Higher Education
  - Wisconsin Vocational, Technical and Adult Education System
- Broadcast facility that takes the lead among programs at various colleges and universities
  - *Examples:* Maryland Center for Public Broadcasting's College of the Air
  - Public Broadcasting Service's Adult Learning Programming Service

[a] A description of each of these programs can be found in Part III of this book.

### Summary

- A wide variety of postsecondary organizations are using telecommunications technologies.
- The composition of the group of colleges and universities surveyed for this study closely corresponds to the universe of colleges and universities in the United States.
- The need to share resources among postsecondary organizations using telecommunications technologies has led to the formation of many formal and informal collaborative arrangements.
- A wide variety of different organizational relationships exist between telecommunications programs and the organizations that sponsor them.

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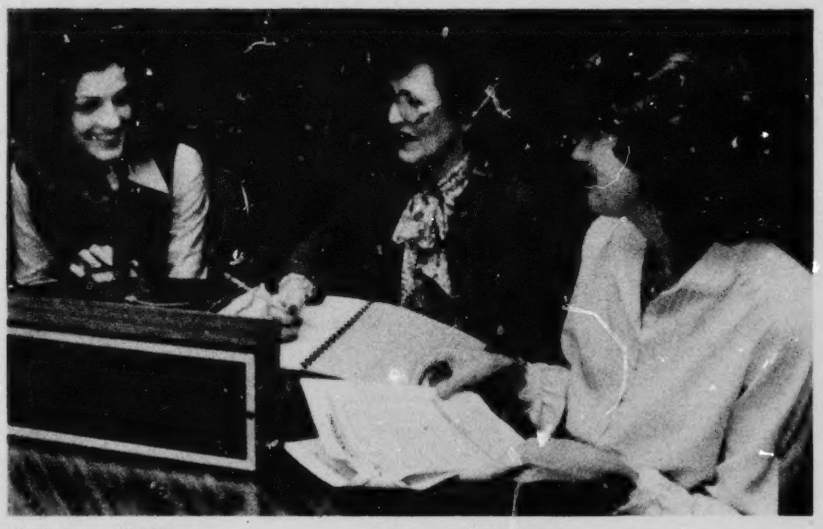
[1] While the proportion of two-year to four-year colleges included in the survey is similar to the proportions in the universe of institutions, the programs sponsored by these institutions, as a whole, are somewhat atypical. Some are modest in scale and relatively unknown nationally, but because the selection criteria emphasize noteworthy features and practices, a high proportion of larger, more well established, programs is included.

# 2. EDUCATIONAL MISSIONS



Audio teleconferencing
-University of Texas Health Science Center at San Antonio

**For what purposes are postsecondary educators using telecommunications technologies?**

Postsecondary educators in the surveyed organizations are using communications technologies to help them accomplish all types of learning-related objectives from basic skills training to highly technical graduate instruction and from public service programming to information and counseling. Populations served vary from traditional-aged college students to Spanish-speaking older adults and from welfare mothers to business executives. This broad range of activity is but one indication of the magnitude of the postsecondary/telecommunications field.

## Educational Activities

As shown in Table 5, the largest number of the surveyed programs use electronic media to deliver adult continuing education (76 percent) and lower-division undergraduate credit courses (64 percent). In many cases the same courses are offered on either a credit or a noncredit basis. These figures reflect both the broad appeal of introductory liberal arts courses (primarily lower-division undergraduate) and personal enrichment courses (primarily adult continuing education). In addition to documenting this well-established pattern, the survey revealed a growing trend toward using telecommunications technologies to deliver vocational/technical courses in subjects such as business, accounting, data processing, real estate, and electronics (16 percent of the surveyed institutions).

A surprisingly high proportion of the surveyed programs are using telecommunications technologies to provide upper-division undergraduate (45 percent) and graduate (31 percent) instruction. These percentages seem high in view of the specialized nature of much of the instruction at this level, the long-standing pattern of faculty resistance to the use of technology, and the problems of providing distance learners with access to research materials. Overall enrollments in these courses are much smaller than in lower-division undergraduate and adult continuing education courses.

### Table 5. Educational Mission

| Educational Mission | Surveyed Programs | |
|---|---|---|
| | *Number*[a] | *Percent* |
| Undergraduate-Lower Division | 45 | 64 |
| Undergraduate-Upper Division | 32 | 45 |
| Vocational/Technical | 11 | 16 |
| Graduate | 22 | 31 |
| Professional Continuing Education | 32 | 46 |
| Adult Continuing Education | 53 | 76 |
| Public Service Programming | 18 | 26 |
| Information and Counseling | 7 | 10 |

[a] The total exceeds 70 because many programs serve more than one educational mission.

Computer-assisted instruction
-Baltimore Mayor's Office of Manpower Resources

There is some overlap between graduate and professional continuing education instruction. Many practicing professionals who already have attained a graduate degree will take graduate courses on a noncredit basis to maintain their professional competency. This is particularly characteristic of the engineering and high technology fields and is one of the reasons why almost half (46 percent) the surveyed programs offer some professional continuing education instruction. In addition to engineering and high technology, the medical, allied health, business, education, and legal professions are those most often served by professional continuing education courses delivered via telecommunications.

Twenty-six percent of the surveyed postsecondary organizations use electronic media to provide public service programming of an educational nature to their community. Only 10 percent of the surveyed programs use one or more of the technologies to deliver information or counseling services to enrolled and/or potential students.

## Clientele Characteristics

The term *working adult* seems to be the most accurate term for characterizing the majority of learners participating in the 70 surveyed programs. In general the characteristics of these working adults are consistent with those described by Patricia Cross and other researchers who have studied patterns of adult participation in education.[1] Level of prior educational attainment is clearly the most critical variable.

Among the surveyed programs offering undergraduate instruction, age and sex characteristics are also very similar to the findings in the general literature; adult students are older than typical undergraduates, yet at the younger end of the age continuum and slightly more likely to be women. In the professional continuing education programs where prior education is a prerequisite, students are older and more likely to be male.

To be more specific, in programs serving undergraduates, the average age of students is in the late twenties or early thirties, approximately 60-65 percent are women. Most live in urban areas, have had some prior college experience, and are members of

### Table 6. Special Populations Served[a]

| Clientele Groups | Surveyed Programs | |
|---|---|---|
| | *Number* | *Percent* |
| Older adults | 11 | 16 |
| Handicapped, homebound | 12 | 17 |
| Incarcerated | 12 | 17 |
| Workers[b] | 12 | 17 |
| Rural | 23 | 33 |
| Spanish speakers | 6 | 9 |
| ABE/GED | 7 | 10 |

[a] Only programs making special programmatic provisions for a clientele group are included in these categories.

[b] Refers to blue and pink collar workers.

families with incomes above $15,000. The vast majority are working either full or part time in the workplace or in the home. Programs offering graduate and professional continuing education serve a population that ranges from recent college graduates in their early twenties to midcareer professionals in their thirties, forties, and fifties.

Many students are simultaneously enrolled in on-campus and off-campus courses. Although the range varies from zero at St. Augustine's College to 85 percent at Columbus Technical Institute, approximately 45-50 percent of the learners taking undergraduate instruction from the surveyed programs are concurrently enrolled in both traditional on-campus classes and off-campus, or distance education, classes. On the other hand, the concurrent enrollment figure for graduate and professional continuing education students is very low (generally less than 10 percent).

Courses in which at least some of the instruction is delivered by electronic media are especially attractive to those learners who find the college campus inaccessible or inconvenient. These learners appreciate being able to learn at home and/or to take advantage of resources at remote learning centers in their community. Many students initially enrolled on a full-time or part-time basis in traditional on-campus courses find that taking courses via telecommunications media is a convenient way to avoid scheduling conflicts and to reduce time spent in on-campus classes.

## Special Populations

Not all those participating in programs that employ electronic media fit the average adult learner profile. Most of the surveyed programs (71 percent) make a concerted effort to use electronic media to serve one or more of the seven special clientele groups listed in table 6. They do this either by offering separate programming designed specifically for that group (e.g., San Diego State University—older adults; the University of Illinois—prisoners), or they adapt their general audience programming for groups with special needs (e.g., Miami Dade Community College—captioning for the hearing impaired; City-Wide College of the City Colleges of Chicago—Spanish language versions of regular courses).

The special population groups referred to in the survey are older adults (more than 55 years of age), homebound and handicapped, prisoners, blue and pink collar workers (those not normally served by professional continuing education instruction), residents of rural areas, Spanish speakers, and adults who need to improve their basic skills or prepare for a high school equivalency examination. Even though most programs serve at least one of these groups, the total percentage serving any one special population is generally less than 20.

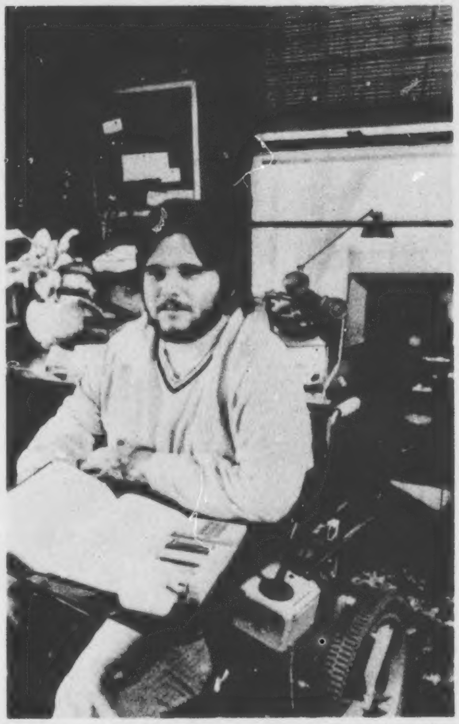
## Geographical Scope of Program Services

Most of the surveyed programs (84 percent) serve a single locality, service district, or state. Of this group, 48 percent also market some educational materials (usually in the form of courses) to other postsecondary organizations around the country. These materials often include courses developed in cooperation with other institutions or organizations such as consortia. The practice of marketing curricular materials nationally is most common among programs that use prerecorded video or audio programming and is one strategy for offsetting some of the costs of course production at the local level.

Of the remaining programs, 6 percent serve regions that include all or part of two or more states, and the remaining 10 percent are national in scope:

*National Scope*
American Bar Association (ABA)
American Dietetic Association (ADA)
Appalachian Community Service Network (ACSN)
Association of Media-Based Continuing Education for Engineers (AMCEE)
National University Consortium (NUC)
Public Broadcasting Service (PBS)
To Educate the People Consortium (TEP)

*Regional Scope*
Eastern Educational Consortium
Community College of Philadelphia—Community College at Home Project
University of Mid-America
WNET/13, New York



Student works from home computer terminal that links him to main system at City University of New York -Queensborough Community College

**Summary**

- Postsecondary organizations are using electronic media to provide educational instruction at the basic skills, undergraduate, graduate, professional, and adult continuing education levels.
- The vast majority of learners served by educational programs using electronic media are working adults.
- Undergraduate programs that use telecommunications technologies serve a high percentage of students who are concurrently enrolled in courses both on campus and off campus.
- The majority of the surveyed programs that use electronic media make some effort to serve the special learning needs of populations like the handicapped, older adults, prisoners, rural residents, and blue and pink collar workers.
- An increasing number of programs are using telecommunications technologies to provide educational services on a statewide, regional, or national scale.

[1] K. Patricia Cross. *Adults As Learners.* San Francisco: Jossey-Bass Publishers, 1981, pp. 53-55.

# 3. TELECOMMUNICATIONS TECHNOLOGIES

Live, interactive video classroom
-The Association for Higher Education of North Texas (AHE)

**What technologies are postsecondary educators using to reach learners?**

Although it is easy to be overwhelmed occasionally by the technical complexity of this rapidly changing field, it does not require extensive technical expertise to understand the most important points about how the 70 surveyed educational programs use telecommunications technologies. By combining everyday knowledge of familiar technologies like television, radio, telephone, and computers with the organizing concepts explored in this section, even the least technically oriented educators can appreciate how communications technologies are currently being used in their profession.

The following short subsection of this chapter discusses why, in subsequent pages, the Guide to Programs distinguishes between interactive and noninteractive telecommunications technologies. This discussion is more specialized than the rest of the chapter and, therefore, may be of less interest to some readers. However, it is included here, rather than in an appendix, because the concept of interaction is so central to an understanding of how telecommunications technologies are used.

## Characteristics of Telecommunications Technologies

Telecommunications technologies have many varied characteristics, any one of which can be selected as the organizing principle for describing the 70 surveyed programs. Some examples of these characteristics are:

Function
Accessibility
Control
Interaction

- We could distinguish among electronic media based on the *function* they perform in the educational delivery system. "Is the technology used to transmit information, to stimulate student response, to motivate learning through other media (e.g., print), or to provide the learner with feedback?"
- We also could characterize the technologies in terms of their *accessibility* to learners. "Is the technology, like broadcast tele-

vision and radio, available in most homes in the United States or is it, like point-to-point microwave television, only available at specially equipped facilities and, therefore, accessible only to those learners for whom the location is convenient?"

- Another alternative is to distinguish among the technologies in terms of the extent of *control* the learner is able to exert over them. "Is it like radio, which does not permit the student to stop or repeat the instructional presentation at his or her convenience, or is it like audiotape, which does offer the student such control?"
- A fourth alternative is to examine the electronic media in terms of the nature and extent of *interaction* they permit between the faculty and the student as well as among the students themselves. "Can the student make comments or ask questions during the instructor's presentation of content material or only at some later time?"[1]

At the risk of oversimplifying what is, at its most technical level, a very complex subject, the remainder of the Guide to Programs will emphasize the interaction characteristics of the media. Thus, the technololgies will be divided into those that are interactive and those thare are noninteractive.

There are numerous reasons for choosing interaction as an organizing concept for the treatment of the technologies. From the *educator's point of view* some of these are:

- student interaction with faculty has always been a central component of formal education whether it occurred in a one-room schoolhouse, a college campus classroom, or in an independent study course
- student interaction with peers is known to contribute greatly to the learning process
- the type of technology selected to deliver instruction can directly affect both the mode of presentation and the nature of student/faculty and peer interaction
- the interactive or noninteractive character of a technology can affect the student's access to it and control over it

From the *point of view of the student* taking a course that uses one or more of the electronic media, there are a number of important considerations that are affected by whether an interactive or noninteractive technology is employed to deliver the course content. For example:

- Do I always have to go to campus or does the technology allow me to learn substantial portions of the course content in my home or at a convenient location in my community?
- Does the technology allow me to ask questions of, and obtain feedback from, the instructor at the time the material is being presented or only at a later date?
- When does the technology make the course sessions available to me? Only at one fixed time? Are the sessions repeated and, if so, how often? Are the sessions available at times convenient to me?
- When using the technology to learn, do I use it alone or with a group of fellow students?

The importance of these questions to the learning process is a major reason for focusing on the interactive characteristics of the technologies throughout the rest of the Guide to Programs.

In the subsequent sections of the Guide to Programs the term **interactive** will be used to refer to technologies that permit at a minimum some form of two-way communication. The form of the communication might be two-way audio (e.g., the telephone) or an electronic print conversation between an individual and a computer program written by a faculty member (e.g., computer-assisted instruction). The term **noninteractive** will be used to refer to technologies that, when used alone, permit communication in only one direction (e.g., broadcast radio and television).

It is important to emphasize that *all* the surveyed programs make some provisions for interaction between students and instructors. Interaction may be achieved by face-to-face contact in classes, written comments sent through the mail, or a conversation via an interactive technology like the telephone. Since contact between students and faculty need not occur only via one of the technologies, subsequent references to programs that use noninteractive technologies should not be misunderstood as implying that student/faculty or even student/peer interaction does not occur.

## Table 7. Telecommunications Technologies

| | Noninteractive | Interactive |
|---|---|---|
| **Audio** | • Radio (primary carrier)<br>• Radio (subcarrier)<br>• Audiotape | • Telephone<br>• Audio Teleconferencing |
| **Video** | • Open-broadcast television<br>• Cable television (one-way)<br>• Videotape<br>• Instructional Television Fixed Service (ITFS)[a]<br>• Satellite television (one-way)<br>• Slow scan/freeze frame television (one-way) | • Microwave (point-to-point)<br>• Cable television (two-way)[b]<br>• Cable television (viewer-response)[b]<br>• Slow scan/freeze frame television (two-way)<br>• Electronic blackboard<br>• Satellite television (two-way)<br>• Video Teleconferencing |
| **Computer** | | • Computer-assisted instruction<br>• Computer-based instructional management |

[a] ITFS is a noninteractive technology when used alone (without telephone or radio talkback).

[b] The terms *viewer-response* and *two-way* are used to distinguish between two types of interactive cable television. See page 36 for an explanation of the differences.

## Table 8. Audio Technologies (One-Way)

| Technology | Surveyed Programs | |
|---|---|---|
| | *Number* | *Percent* |
| Radio (primary carrier) | 16 | 23 |
| Radio (subcarrier) | 2 | 3 |
| Audiotape | 29 | 41 |

In addition to the terms interactive and noninteractive, there are many references in the subsequent pages to various combinations of technologies. Although a few of the 70 surveyed programs rely entirely on one technology to serve their learners, the vast majority employ some combination of two or more technologies. Without exception these combinations involve at least one interactive technology. One way of thinking about the technologies used by the surveyed programs is to group the programs into three categories:

**Type A programs** use only one noninteractive technology (e.g., Association for Media-Based Continuing Education for Engineers (AMCEE) uses only videotape).

**Type B programs** use only one interactive technology (e.g., the University of Illinois PLATO Corrections Project uses only computer-assisted instruction to serve its students).

**Type C programs** use some combination of two or more technologies that includes at least one interactive technology (e.g., Milwaukee Area Technical College uses open broadcast television, cable television, radio, videotape, audiotape, and telephone). As this Type C example illustrates, the interactive technology often used is regular telephone service.

The following description of the various technologies used by the 70 surveyed programs begins by focusing on the more familiar noninteractive technologies and then proceeds to the interactive technologies. Table 7 lists the interactive and noninteractive technologies used by the surveyed programs and discussed in the following pages. The table includes only those technologies that are used in one form or another by one of the 70 surveyed programs. Other technologies such as videotex, videodisc, and computer conferencing would have been included if any programs satisfying the survey criteria had been identified.

## Noninteractive Technologies

This section includes discussions of noninteractive audio and video technologies.

### Audio Technologies

From the student's point of view, two of the most convenient and least complex technologies are radio and audiotapes. Both are readily accessible, highly portable, and relatively inexpensive. For these reasons and because one-way audio does not demand the listener's visual attention, students can learn while in cars, buses, or trains as well as in their homes, on their jobs, or on the campus. The one-way audio technologies used by the surveyed programs include radio, subcarrier radio, and audiotape (see table 8).

### Radio

Most educational programs that use radio rely on public FM stations (often college or university licensees), although some also use commercial AM and FM stations to reach students. In addition, two colleges in the survey (Central Piedmont Community College and Rio Salado Community College) also use Subsidiary Carrier Authorization (SCA) radio to provide reading services for blind and visually handicapped citizens who rent, purchase, or are given special SCA radio receivers. SCA radio technology is possible because FM radio transmitters can broadcast numerous programs at the same time. When certain frequencies are encoded at the point of transmission, they can be received only by listeners with SCA receivers.

Judging from the stated future plans of the staffs of many of the surveyed programs, there seems to be growing interest in the use of radio/audio courses among postsecondary educators. In all but one case, the surveyed programs that use radio courses also offer television courses. This pattern suggests that at this point in time few educators rely on radio as their only delivery technology.

### Audiotape

Many institutions that offer radio courses also give students the option of taking the same course on an independent study basis by listening to audiotapes and completing other course components such as readings, assignments, and tests at their own pace. City-Wide College of Chicago is one of the institutions offering such an option. In addition to the independent study option, most of these colleges use audiotapes to repeat radio broadcasts that students may have missed. At West Virginia Wesleyan College, where SCA radio often proved unable to penetrate the mountainous terrain of the college's service area, the Outreach Education program now relies completely on courses that combine audiotape and print components to reach distance learners. Audiotapes are also used by some institutions (such as the University of Wisconsin-Extension) to record live, interactive audio teleconferences for use by students who missed the teleconference or who wish to review the material at a later time.

In order to make audiotape or radio course material more accessible to students, some institutions, such as Tacoma Community College, combine audiotapes with the telephone in what is often referred to as a dial-access system. By calling a designated telephone number the student can access the appropriate audiotape from anywhere at any convenient time. This can be done either manually by a telephone operator or automatically by a telephone-accessed audiotape machine (if the caller uses a touch-tone telephone). Although the result is not an interactive conversation between student and instructor, it is a way of combining technologies to substantially increase student access to educational materials. The DOLLY System at Central Piedmont Community College is a dial-access system which provides an extensive selection of noncredit public service information to the community.

### Video Technologies

The pervasiveness of television in our society is reflected by the extent to which postsecondary educators have relied upon the various forms of this technology for serving students. Although not quite as portable as radio and audiotapes, video technologies have the advantage of being able to portray visual images of people, places, events, and ideas that are either difficult or impossible to convey through an audio medium alone.

The vast majority of the 70 programs included in the survey use some form of noninteractive video technology. Videotape, open-broadcast television, and cable television (one-way) were the most frequently employed noninteractive technologies (see table 9).

The most common pattern is for an institution to use public and/or commercial open-broadcast television as its primary video technology because of its ability to reach large numbers of students. Videotapes and cable television often are used in a supplementary fashion to repeat video programming for the convenience of students. However, many programs do use videotapes or cable television as their primary delivery technology.

### Videotapes

Next to the telephone, videotapes are the most often used technology among the 70 surveyed programs. In addition to supplementing programming initially provided over other video technologies, videotapes are increasingly employed as a primary de-

**Table 9. Video Technologies (One-Way)**

| Technology | Surveyed Programs | |
|---|---|---|
| | *Number* | *Percent* |
| Videotape | 55 | 79 |
| Open-broadcast television | 35 | 50 |
| Cable television (one-way) | 34 | 49 |
| Instructional Television Fixed Service (ITFS)[a] | 15 | 21 |
| Satellite television (one-way) | 4 | 6 |
| Slow Scan/Freeze Frame (one-way) | 2 | 3 |

[a] Ten of the programs use ITFS as part of an interactive delivery system by combining it with radio talkback (an FM microwave technology) or the telephone while the other five primarily use it in a one-way mode.

livery technology. The gradual proliferation of video cassette playback equipment has made this portable technology increasingly accessible to students. It also has an advantage over other forms of video in that it allows the student to exercise more control over the programming. For example, students can start, stop, and replay the presentation, giving them the opportunity to proceed at their own pace.

Only three surveyed programs (the Association for Media-Based Continuing Education for Engineers—AMCEE; Colorado State University; and the North Carolina State University, School of Textiles) use videotapes (combined with print materials) exclusively for delivering instructional materials to distance learners. Most other videotape users employ the technology as a way of making broadcast or cablecast video programming available to students at on-campus learning centers, libraries, and distance learning sites in the community. Some institutions such as the Univeristy of Minnesota and Northern Virginia Community College use videotapes as integral components of independent study programs in which students view videotapes at their own pace rather than according to a broadcast or cable television schedule.

Videotapes are also used in combination with interactive technologies in some delivery systems. For example, the College of San Mateo combines videotapes with microcomputers to train workers in electronics factories. Between 1975-78 Michigan State University's Rockford Project combined videotapes and computers in an interactive cable experiment funded by the National Science Foundation. Increasingly audio teleconferencing networks such as the Kansas Regents Continuing Education Network—TELENET and the University of Texas Health Science Center at San Antonio—Teleconference Network of Texas are distributing videotapes to sites in their networks to supplement the audio programming. In addition, programs like the TAGER Television Network of the Association for Higher Education of North Texas that rely on interactive video technologies make videotapes of their live programs available to those wishing to view the programming after it occurs.

### Open-Broadcast Television

Broadcast television has been used to provide instruction since the mid-1950s when Chicago's T.V. College (now part of City-Wide College of Chicago) and New York University's Sunrise Semester began offering courses. One-half of the 70 programs included in the survey use public and/or commercial broadcast television to serve their learners. In almost all cases open-broadcast television was the primary delivery technology with cable and videotape used as secondary technologies to repeat programming at convenient times. Open-broadcast television is used by 71 percent of the two-year colleges, 39 percent of the four-year colleges and universities, 64 percent of the consortia, and 80 percent of the broadcast facilities in the survey. It clearly accounts for the largest number of enrollments among the surveyed programs.

In spite of the increased availability of cable television and use of videotapes, open-broadcast television continues to be the most effective technology for reaching large numbers of learners in their homes because it is so inexpensive and so pervasive. The existence of national efforts like the Public Broadcasting Service's Adult Learning Programming Service tend to reinforce the reliance on broadcast television even in the face of the expanding use of altenative technologies.

### Cable Television (one-way)

Currently few communities are completely wired for cable television and most of the current cable systems are only six- to twelve-channel systems. Thus, educators have generally used the existing small, but expanding, cable systems to replay programming offered over open-broadcast television. Almost half (49 percent) of surveyed programs make some use of one-way cable—an indication of its growing significance as an educational delivery technology. For educators cable technology is attractive because it usually has more time available for programming than is the case with broadcast television. In addition it is almost always without cost to the college. Unfortunately, this is not the case for the learner who must pay cable subscription fees.

As more major metropolitan areas such as Dallas, Pittsburgh, and Baltimore make the transition from awarding a franchise to being fully wired for cable, educators are likely to rely more heavily on this technology as their primary vehicle for reaching students. In communities, such as San Diego, that have a high percentage of cable subscribers, cable television is already the primary educational delivery technology.

### Instructional Television Fixed Service (ITFS)

ITFS is a broadcast television technology that enables locations in a community equipped with the appropriate antennae to receive audio and video signals, thereby creating a "closed-circuit" television network that is relatively inexpensive to operate. In some cases this technology is used to link various local cable television companies with educational institutions to facilitate convenient distribution of courses (e.g., Wayne State University, Miami-Dade Community College, and San Diego and Imperial Counties Community College Association). In other cases, ITFS is used to create an educational network among hospitals (e.g., Emory University School of Medicine); churches and community agencies (e.g., Catholic Television Network); industries (e.g., Stanford University); or a combination of colleges and universities, hospitals, industries, and community agencies (e.g., Indiana Higher Education Telecommunication System).

Even though this technology by itself is noninteractive, it is most often used in combination with other technologies, such as the telephone, which makes it interactive (one-way video, two-way audio). Two of the surveyed programs (Emory University School of Medicine and the Catholic Television Network) broadcast a great deal of prerecorded video material over their ITFS systems in a noninteractive mode. However, for certain types of live programming they invite viewers to call in by telephone to interact with the instructor. The other programs in the survey that employ ITFS technology use their systems interactively on a regular basis by combining it with the telephone (e.g., the Association for Higher Education of North Texas—TAGER) or with an FM microwave technology called radio talkback (e.g., California State University at Chico).

### Satellite Television (one-way)

Many of the surveyed programs receive educational programming via satellite from the Public Broadcasting Service (PBS), the Appalachian Community Service Network (ACSN), or the National University Consortium (NUC). In fact one of them, Pennsylvania State University, receives satellite programming from all three sources. With rare exceptions this noninteractive programming is in the form of prerecorded television courses. PBS and ACSN are among those surveyed programs that also make use of satellites to provide special purpose interactive video teleconferences as well as prerecorded courses.

Satellite distribution makes national educational program schedules technically possible and financially affordable. Many of the programs included in the survey indicated they are exploring the possibility of using communications satellites to send and/or receive programming.

### Slow Scan/Freeze Frame Television (one-way)

Slow scan/freeze frame technology enables video images to be transmitted over telephone circuitry and captured as a series of single frames, thus making it less expensive to transmit than the full-motion video technologies we are more accustomed to seeing. It can be used in either a one-way, noninteractive mode or in an interactive mode. Typically it is used in combination with other technologies. For example, Rio Salado Community College uses slow scan/

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**Table 10. Interactive Audio**

| Technology | Surveyed Programs | |
|---|---|---|
| | *Number* | *Percent* |
| Telephone | 65 | 93 |
| Audio teleconferencing | 15 | 21 |

freeze frame television in a one-way mode to accompany its audio teleconferencing system. The University of Wisconsin—Extension currently uses this technology in a one-way mode at the 23 sites in its SEEN network but plans to operate in both directions in the near future.

## Interactive Technologies

This section includes separate discussions of interactive audio, video, and computer technologies.

### Audio Technologies

Regular telephone service and audio teleconferencing, two interactive technologies are employed by the surveyed programs (see table 10).

**Telephone**

The electronic technology used by the surveyed programs more than any other is also the one that has been around the longest—the telephone. Not only is it pervasive in our society, but it is also a reliable and relatively low-cost technology. Of the 70 programs surveyed, 65 use the telephone in some capacity to serve learners.

Regular telephone service, or POTS ("plain old telephone service") as it is sometimes called, is most commonly used to supplement programs that rely heavily on noninteractive audio technologies like radio or noninteractive video technologies like broadcast and cable television. Yet, regular telephone service is not used as the primary technology by any of the programs. Since students and faculty in programs that use noninteractive technologies cannot discuss course material with the instructor at the time the course sessions are broadcast or cablecast, the telephone offers a convenient way for them to experience one-to-one communication even if it does not occur simultaneously with the audio or video programming.

The pattern of one-on-one student/faculty interaction via telephone during designated faculty office hours is almost universal in programs using prerecorded audio or video programming. However, there are some drawbacks to such arrangements. For example: it is often difficult to find times that are convenient for both student and faculty, it can be difficult motivating faculty and students to initiate calls to one another, and it does not allow for peer interaction among students.

In addition to using regular telephone service during faculty office hours, it is also used to add an interactive component to delivery systems during live programming that is transmitted to students over noninteractive technologies. By encouraging learners to use their telephones to call in to the instructor during live course sessions, a form of interactive learning is possible. Among the surveyed programs there are examples of combining regular telephone with open-broadcast television (e.g., WYES, New Orleans), with ITFS (e.g., Catholic Television Network), and with cable television (e.g., San Diego State University).

**Audio Teleconferencing**

Audio teleconferencing is an interactive technology that is increasingly being used in business, industry, medicine, and education to facilitate group voice communication for meetings and instruction. Individuals participating in an audio teleconference can communicate with one another by using either dedicated (leased) telephone lines or by dialing into a telephone bridging service capable of linking three or more telephone lines from any location on an ad hoc basis for the duration of the teleconference. By using either approach, or a combination of both, groups of teleconference participants at numerous sites are able to communicate freely with one another. Unlike regular telephone service, this technology enables students to interact with their peers as well as with the instructor while the course session is underway.

Many of the 15 surveyed programs that use audio teleconferencing supplement their audio programming by combining it with one or more video technologies, thus creating a two-way video delivery system. Some examples of this pattern are:

- University of Nevada—slides and overhead transparencies
- College of Great Falls—videotapes
- Kansas Regents Continuing Education Network—TELENET—slides, overhead transparencies and videotapes
- University of Wisconsin—Extension—slow scan/freeze frame television

Audio teleconferencing is most often used to provide educational services to widely dispersed populations. Some of the surveyed programs serve large service districts within states, others serve entire states, and one even serves a national professional clientele (see table 11).

Queensborough Community College makes specialized use of telephone confencing technology to serve handicapped and homebound students. By using a special telephone conference system, this college links homebound and handicapped students with live on-campus classes. The student at home is able to use a regular telephone or a speakerphone and can listen to the class presentation and interact with the instructor and students.

### Video Technologies

The next best thing to being there for the distance learner may well be taking a course that uses technologies which make it possible for participants in the experience to be seen as well as heard. The surveyed programs use a variety of technologies in order to provide students with either one- or two-way video in combination with two-way audio. See table 12 for a list of the interactive video technologies employed by the surveyed programs.

### Table 11. Scope of Some Audio Teleconferencing Services

- **Large Service Districts** (within a state)
    - College of Great Falls
    - Eastern Oregon State College
    - Rio Salado Community College
    - University of Nebraska
    - West Virginia College of Graduate Studies

- **Statewide Networks**
    - Indiana Higher Education Telecommunication Systems (IHETS)
    - Kansas Regents Continuing Education Network (TELENET)
    - Pennsylvania State University
    - University of Nevada (UNITE)
    - University of Texas Health Science Center at San Antonio—Teleconference Network of Texas (TNT)
    - University of Washington (WETNET)
    - University of Wisconsin-Extension (ETN and SEEN)
    - West Virginia College of Graduate Studies (COGS)

- **National Professional Clientele**
    - Trinity University (health care administrators)

### Table 12. Interactive Video

| Technology | Surveyed Programs Number | Surveyed Programs Percent |
|---|---|---|
| Microwave (point-to-point) | 5 | 7 |
| Cable television (two-way) | 1 | 1 |
| Cable television (viewer-response) | 3 | 5 |
| Slow scan/freeze frame (two-way) | 1 | 1 |
| Electronic blackboard | 1 | 1 |

#### Point-to-Point Microwave

Point-to-point microwave is a broadband technology that is capable of transmitting both video and audio signals in two directions. The TAGER Television Network of the Association for Higher Education of North Texas, Kirkwood Community College, and Medical Care Development, Inc. (MCDI) all use this technology to link participating organizations and sites. For TAGER these sites are universities and industries, for Kirkwood they are the main campus and regional learning centers, and for MCDI they are hospitals and a university. In such systems programming can originate from any participating location. In addition, Kirkwood and MCDI have designed their systems so that communication among two or more groups of sites can occur simultaneously if a faculty member chooses to temporarily reconfigure the network for some reason. With this microwave technology not all programming needs to be two-way video and audio at all times. In fact, the TAGER Television Network often uses dedicated telephone lines for audio return rather than using the full two-way video and audio capacity of their point-to-point microwave system.

Slow scan television camera and monitor
-Medical Care Development, Inc.

**Cable Television (two-way)**[2]
The only example of two-way video and two-way audio cable television among the surveyed programs is Berks Community Television of Reading, Pennsylvania. In this community local citizens who come to specially equipped facilities such as a senior citizens center, a high school, or the county courthouse can participate in public service and educational programs in which individuals at all sites can be both seen and heard by everyone on the cable system. By using split-screen video images participants at two different sites can be seen at once. Residential cable subscribers can view the video portion of the programming (but not be seen by others on the network) and interact with participants at the sites by using their telephones to call in comments to the program moderator.

**Cable Television (viewer-response)**[2]
Along with all the recent cable franchising activity there has been much discussion about interactive cable. In most cases what cable companies are offering is not two-way video as it exists in Reading, Pennsylvania. Rather, it is a technology that provides viewers with one-way video and one-way audio communication combined with keypads, or polling devices, with which they can transmit impulses to a central computer in response to questions posed by the instructor or moderator. Viewer responses, which are normally limited to options such as "understand," "don't understand," "slow down," "give example," "yes," "no," or "agree," "disagree" are immediately summarized by the central computer for the instructor or moderator and, often, for the viewing audience, thus enhancing the interactivity of the experience. The interaction can be diversified by also allowing students to telephone the instructor during the program.

Three of the programs surveyed employed such computerized, interactive (or polling) cable television technology. They are Columbus Technical Institute, which uses the QUBE system; Rand Corporation and Telecable of Spartanburg, South Carolina, which conducted an experiment sponsored by the National Science Foundation (1975-78); and Michigan State University, which also conducted an NSF experiment in Rockford, Illinois, during the same three-year period. The Rockford project did not continue in the same form beyond the grant period, but some community-sponsored informal, educational programming which uses the interactive capacity of the cable system still continues in Spartanburg.[3]

**Slow Scan/Freeze Frame Television (two-way)**
Whether it is called slow scan television or freeze frame television, this technology captures still pictures on a television monitor and can be used in either a one-way or two-way mode. The only surveyed organization using it in a two-way mode is Medical Care Development, Inc., which initiated a two-way application of this technology for a medical education program in Maine called the Aroostook County Telecommunications System (ACTS). With the installation of slow scan equipment at five hospitals, ACTS is able to provide two-way video and audio communication over telephone lines, which is much less expensive than the broadband video technology that is necessary for full-motion video.

**Electronic Blackboard**
The electronic blackboard is a telephone-based technology that is capable of transmitting hand-drawn graphics over long or short distances. For example, at the University of Illinois at Urbana-Champaign, the Office of Continuing Education and Public Service—Engineering uses this technology to provide engineering courses simultaneously to on-campus students and to employees at seven industrial locations. The instructor writes on an electronically sensitive blackboard that is connected to a telephone line, and the students at the remote sites view the graphic images on a television monitor. When the instructor and each remote site are equipped with an electronic blackboard, television monitors, and a separate telephone line for audio communication, the result is an interactive audio and video delivery system. It is technically possible to employ this technology with an electronic blackboard at the originating site only and with television monitors (plus the extra telephone line for audio communication) at the remote sites. However, it is most often used in a two-way mode with elec-

tronic blackboards and television monitors at all sites. This technology is most often used in courses where it is important for students and faculty to communicate graphically (e.g., statistics, engineering).

**Satellite Television (two-way)**
Communications satellites are capable of transmitting video and audio signals from a single point of origination to numerous earth stations scattered over a large geographical area. If only one location is equipped to originate signals, then interactive programming is only possible if an audio technology like the telephone is used to permit feedback from the receiving sites. An example of a program that uses satellite technology in combination with the telephone is American Dietetic Association's NEWSTARS program.

We were unable to locate any educational programs that use communication satellites to conduct the kind of two-way video, two-way audio teleconferencing used by some businesses for meetings and training. The high cost and technical complexity of such programming is clearly a disincentive for most educational organizations.

With the creation of the National University Teleconferencing Network in 1982 and the anticipated establishment of Public Service Satellite Consortium's Campus Conference Network in 1983, there is likely to be much more educational use of satellite technology to deliver all types of interactive programming.

**Video Teleconferencing**
Unlike the preceding video categories, video teleconferencing is more of a concept than a specific technology. The term video teleconferencing can be used to characterize communication among people at multiple sites that involves either one-way or two-way video. It can involve the use of a single technology like point-to-point microwave or combinations of two or more technologies such as ITFS and regular telephone service. Some examples of surveyed programs that conduct video teleconferencing are:

Kirkwood Community College—point-to-point microwave

Stanford University—ITFS and talkback radio

Catholic Television Network—ITFS and telephone

Appalachian Community Service Network—satellite, cable television, and telephone

American Dietetic Association—satellite, ITFS, and telephone

**Table 13. Computer-Based Technologies**

| Technology | Surveyed Programs | |
|---|---|---|
| | *Number* | *Percent* |
| Computer-Assisted Instruction (CAI) | 7 | 10 |
| Computer-Based Instructional Management (CBIM) | 4 | 6 |
| Computer/videotape interface | 3 | 4 |
| Computer/cable interface | 3 | 4 |

**Computer-Based Technologies**
Because the survey focuses on delivery systems with a capacity to serve learners off campus as well as on campus, it includes a more modest selection of educational applications of computer-based technologies than would have been the case had the focus been exclusively on programs that serve on-campus students. Until the recent proliferation of microcomputers, few educational programs have been able to overcome the financial, technical, and security problems of serving learners off campus with computer technology. Still, 14 of the 70 programs surveyed use one or more of the computer-based technologies to perform varying combinations of the following functions:

- deliver instruction directly to students
- assess student performance by way of pre- and posttests
- manage instructional programs by routing students to prescribed instructional materials both on and off the computer
- provide print or graphic records of student performance for use by both faculty and student

**Computer-Assisted Instruction (CAI)**
Three surveyed programs (City of Baltimore Mayor's Office of Manpower Resources, Saint Augustine's College, and the University of Illinois at Urbana-Champaign) use the PLATO system, which was developed by the University of Illinois and Control Data

Computer/videotape interface
College of San Mateo

Corporation to provide individualized instruction simultaneously to large numbers of students. The students served by these programs include unemployed adults, senior citizens, welfare mothers, and prisoners who need assistance in upgrading their basic skills in preparation for job training and/or to obtain a high school equivalency certificate. PLATO is also used by the University of Illinois and many other institutions to provide individualized instruction in college level courses.

Because of the basic skills deficiencies of the adult students in these three surveyed programs, the nonthreatening, individualized, and self-pacing nature of computer-assisted instruction makes it a particularly appropriate technology for this clientele. The PLATO terminals include a keyboard and graphics display screen which the students can touch to indicate their response as an alternative to using the keyboard. Instructional methods include drill and practice, tutorial, simulation, gaming, and problem solving.

Two other programs (Eastern Oregon State College and Queensborough Community College) use computer-assisted instruction to teach students with special learning needs. Programs that combine CAI with other technologies such as videotape and cable television are described later in this section.

Given the rapidly expanding nature of the home computer market, it is reasonable to assume that many educational institutions will be developing compatible CAI software and integrating it into programs that serve students both on and off campus. Since the programs included in this survey already have delivery systems in place, they are in an excellent position to incorporate microcomputers into their current services, and, in fact, many have plans to do so.

### Computer-Based Instructional Management (CBIM)

The term *computer-based instructional management* is used by some to describe computer applications that address management and instructional activities equally. Miami-Dade Community College has developed such a computer application, which it calls Response System with Variable Prescriptions, or RSVP. This system enables the faculty member to manage instructional strategies designed to provide each student with individual attention. It maintains student records including class assignments, quizzes, and examinations and prints out reports to the instructor and letters to the individual students. The reports and letters detail progress to date, diagnose student problems, and prescribe personalized reading assignments based on the student's response to specific test items. A similar batch-processing CBIM system is also employed by Coastline Community College and Pennsylvania State University. Rio Salado Community College is using a microcomputer to perform many of the same functions.

These CBIM systems are interactive in that the computer responds to input generated by students in the form of answers to tests. Unlike CAI, CBIM, as it is used by the surveyed programs, does not permit the student to interact directly with the computer. Input to the computer is on precoded forms, and the feedback to the student is in the form of print material that is either mailed or delivered by the staff to the student. As the term CBIM implies, it is an instructional management tool as well as a means of instruction.

### Computer/videotape Interface

An example of the potential for linking microcomputers to other technologies is found at the College of San Mateo where a CAI approach is combined with videotape. Employees in the electronics industry use Apple II microcomputers in combination with videotapes to receive college credit instruction at their worksite. Reading assignments, videotaped laboratory experiments, hands-on skill modules (performed at work stations), and quizzes are all coordinated by the microcomputer with software developed by the project staff. Another example of a computer videotape interface is the Michigan State University Rockford Two-Way Cable Project. A central computer was used in combination with videotape playback equipment located at various fire stations and connected to the interactive cable system. Although successful from a technical and educational standpoint, this experiment did not continue. Nevertheless, a similar system could be implemented in other areas with interactive cable television capacity.

**Computer/cable Interface**

The three examples of computer/cable interface are discussed earlier in this section under the heading "Cable Television (viewer-response)."

## Additional Applications of Computers to Education

In addition, there are other technologies (e.g., videodisc, videotex) still in their experimental or early operational stages that, when combined with microcomputers, have enormous potential for educational programs serving learners on the campus, in the community, or in the home. Unfortunately, since these technologies are still in the early stages of development, we were unable to identify programs that fit the survey selection criteria.

## Combinations of Technologies

It is clear from the preceding discussion of interactive and noninteractive technologies that there is a growing trend toward combining more than one technology within the same educational delivery system. However, programs that do combine technologies generally rely more heavily on one technology than on the others.

The most common pattern is for a program to use a noninteractive technology that reaches many learners (e.g., open-broadcast television) as its primary delivery mode and then to supplement it with other noninteractive technologies like videotapes and at least one interactive technology, usually the telephone (e.g., University of Nebraska). Another trend is for programs that rely primarily on an interactive technology to combine it with a noninteractive technology. One example of this trend is the Kansas Regents Continuing Education Network—TELENET, which uses videotapes to add a visual component to its audio teleconferencing system.

Even though the College of San Mateo is the only surveyed program that combines microcomputers with videotape, educators will surely find ever increasing ways to link the problem solving capacity of microcomputers with the visual communication advantage of video. In the near future we are likely to see many of the programs that currently rely on video technology integrating microprocessors into their delivery systems.

Table 14 contains examples of some of the ways the surveyed programs that rely primarily on noninteractive technologies are combining various technologies to serve students. Table 15 contains similar information on surveyed programs that rely primarily on interactive technologies.

The surveyed programs testify to the fact that, unlike the early days of instructional television and radio when educators relied almost exclusively on one or two technologies, more and more educational delivery systems are combining numerous technologies in order to tailor their services to the needs of their students. The Open College at Miami-Dade Community College, which combines open-broadcast television, cable television, ITFS, radio, videotapes, audiotapes and computers exemplifies this trend.

### Summary

- Educators do not need a technical background to gain a general understanding of what telecommunications technologies are and how they are currently being used.
- In contrast to the past when postsecondary educators more often relied on a single delivery technology to reach students, they are now combining numerous electronic media in order to tailor their services to the needs of their students.
- It is important for educators to understand the differences between interactive and noninteractive technologies.
- All the surveyed programs make some provisions for student/faculty interaction, whether it occurs via an interactive technology or in face-to-face meetings and correspondence.
- Most surveyed programs use some combination of two or more technologies; in all cases involving such combinations at least one of these is an interactive technology (e.g., telephone).
- The vast majority of surveyed programs use some form of noninteractive video technology (e.g., videotape, open-broadcast television, cable televison).
- Radio/audio courses are most commonly offered by programs that also offer video courses; only two of the programs rely entirely on radio or audio cassettes to reach students.
- Cable television is used by almost half the surveyed programs; with some notable exceptions it is most often used to replay video programming initially offered over open-broadcast television.
- Audio teleconferencing is used increasingly by educators to provide interactive programming to learners dispersed over large geographical areas.
- Only a small proportion of the surveyed programs are using interactive video technologies (e.g., interactive cable television, point-to-point microwave).

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[1] For a thoughtful discussion of these and other media characteristics, refer to Tony W. Bates, "Roles and Characteristics of Television and Some Implications for Distance Learning." *Distance Education*. Vol. 3, No. 1, 1982, pp 28-50.

[2] The terms *two-way* and *viewer-response* are used here to distinguish between two different types of interactive cable technologies. The programs themselves do not always make this distinction clear in the language they use to describe their activities. For example, the Rockford project sponsored by Michigan State University was referred to as "two-way" in its title. In this book it is categorized as "viewer-response."

[3] For more information about why the original NSF projects were not continued in their original form, refer to the individual program descriptions in Part III of this book.

## Table 14. Noninteractive Technologies

**Examples of Programs Using Noninteractive Technologies Alone and in Combination with Other Technologies**

**Noninteractive Technology**

**Audio**

- Radio (primary carrier)
  University of Minnesota[a]
- Radio (SCA)
  Central Piedmont Community College
- Audiotape
  West Virginia Wesleyan College

**Video**

- Open-Broadcast Television
  WNET/13, New York
- Cable Television (one-way)
  CABLE, Spokane
- Videotape
  Colorado State University
- ITFS
  Emory University School of Medicine[b]
- Satellite Television (one-way)
  Pennsylvania State University
- Slow Scan/Freeze Frame Television (one-way)[c]

**Combinations of Technologies**

- Radio/Audiotape/Telephone
  Tacoma Community College
- Audiotape/Telephone
  Central Piedmont Community College[d]

- Broadcast Television/Videotape/Telephone
  Kentucky Council on Higher Education
- Broadcast Television/Radio/Cable Televison/Telephone
  Southern California Consortium for Community College Television
- Broadcast Television/Cable Television/Audio Teleconferencing/Telephone
  West Virginia College of Graduate Studies
- Broadcast Television/Radio/Videotape/Audiotape/Telephone
  City-Wide College of Chicago
- Broadcast Televison/ITFS/Cable Television/Telephone/Computer/Videotape/Audiotape
  Miami-Dade Community College
- Broadcast Television/ITFS/Cable Television
  Wayne State University
- Cable Television/Telephone
  San Diego State University
- Cable Television/Broadcast Television/ITFS/Telephone
  San Diego and Imperial Counties Community College Association
- Videotape/telephone
  North Carolina State University
- ITFS/Telephone
  Catholic Television Network
- ITFS/Talkback Radio
  Stanford University
- ITFS/Talkback Radio/Cable Televison/Telephone
  California State University at Chico
- ITFS/Microwave/Cable Televison/Telephone
  Association for Higher Education of North Texas (TAGER)
- Satellite/Cable Television/Telephone
  Appalachian Community Service Network
- Satellite/ITFS/Telephone
  American Dietetic Association

Note: Only one program is listed in each category as an example even though other programs use the same technology or combination of technologies to deliver an educational service like instruction.

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[a] The University of Minnesota also offers separate television courses.

[b] Emory University School of Medicine also uses ITFS in combination with telephone call-ins for some programming.

[c] None of the surveyed programs used slow scan-freeze frame television in a one-way mode by itself, but some did use it in a two-way mode or in combination with an interactive technology.

[d] Central Piedmont Community College also offers separate television courses.

## Table 15. Interactive Technologies:

**Examples of Programs Using Interactive Technologies Alone and in Combination with Other Technologies**

**Interactive Technology**

**Audio**

- Telephone[a]
- Audio-teleconferencing
  University of Wisconsin-Extension (ETN)

**Video**

- Microwave (point-to-point)
  Kirkwood Community College
- Cable Televison (two-way)
  Berks Community Television
- Cable Television (viewer-response)
  Columbus Technical Institute
- Slow Scan/Freeze Frame Television (two-way)
  Medical Care Development, Inc. (ACTS)
- Electronic Blackboard
  University of Illinois

**Computer**

- Computer-Assisted Instruction
  University of Illinois
- Computer-Based Instructional Management
  Miami-Dade Community College

**Combinations of Technologies**

- Audio Teleconferencing/Videotape
  University of Texas Health Science Center at San Antonio
- Audio Teleconferencing/Freeze Frame Television
  University of Wisconsin (SEEN)
- Microwave (point-to-point)/Slow Scan Television
  Medical Care Development, Inc. (CMITS and ACTS)
- Microwave (point-to-point)/ITFS/Telephone
  Association for Higher Education of North Texas
- Microwave (point-to-point)/ITFS/Cable Television/Telephone
  Kirkwood Community College
- Open Broadcast Television/Cable Television/Microwave (point-to-point)/Talkback Radio
  University of South Carolina
- Cable Television (viewer-response)/Videotape
  Michigan State University (Rockford Cable Project)
- Computer/Videotape
  College of San Mateo

Note: Only one program is listed in each category as an example even though other programs use the same technology or combinations of technologies to delivery some educational service like instruction.

[a] No surveyed program uses regular telephone service as its only technology, but the vast majority do use it in combination with other technologies.

**Summary (Contd.)**

- Computer-Assisted Instruction (CAI) and Computer-Based Instructional Management (CBIM) are the two most common applications of computer technology among programs in the survey.
- The personal computer market is just beginning to influence significantly programs that serve learners both on and off campus.

# 4. CURRICULUM

Interactive video conference table
-Medical Care Development, Inc.

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**What kind of instruction is being delivered by telecommunications technologies?**

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Judging from the activities of the 70 surveyed programs, postsecondary educators are using telecommunications technologies to help them teach virtually all levels of instruction and all disciplines, for both credit and noncredit purposes. There are noticeably different patterns in the use of the technologies at the undergraduate level and at the graduate and professional continuing education level.

## Undergraduate Education

In the past undergraduate instruction delivered by video technology was limited primarily to introductory social science and humanities courses. More recently educators are producing numerous video courses for national distribution in the sciences (e.g., oceanography, physics, astronomy, biology, anatomy), business (e.g., management, small business, computers), and vocational/technical subjects (e.g., data processing, electricity, real estate).

At the lower-division undergraduate level the most common pattern is for postsecondary organizations to lease video courses, or "telecourses" from colleges, universities, or companies that produce courses for national distribution. Even institutions like Coastline Community College, Dallas County Community College District, and Miami-Dade Community College that produce telecourses also lease some courses from other national producers. Some community colleges produce video courses primarily for their own use and only occasionally produce courses to be marketed nationally (e.g., Central Piedmont Community College).

The pattern is somewhat different at the upper-division undergraduate level. Programs that focus more on upper-division instruction often produce courses for their own use. This is, in part, because there are fewer nationally distributed television courses appropriate for this level. For example, the University of South Florida produces its own prerecorded video and audio courses, and California State Universi-

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ty at Chico employs ITFS technology to broadcast live on-campus classes to remote sites. However, there are also many four-year institutions that lease television courses.

Some programs that assist colleges and universities in their efforts to serve both upper- and lower-division undergraduates are attempting to expand the selection of available prerecorded video courses. For example, The To Educate the People Consortium (TEP) already offers its member institutions a complete bachelor's degree curriculum, one-third of which is composed of video courses. Both the National University Consortium and the Public Broadcasting Service's Adult Learning Programming Service intend to offer a complete bachelor's degree curriculum using video courses in the not too distant future. In addition, the Corporation for Public Broadcasting's Annenberg Project is using its funds to encourage the development of audio and video courses that fit into a degree program.

Radio courses generally focus on introductory undergraduate courses in the humanities and social sciences. Currently, there are too few radio/audio courses available for national distribution to constitute either an associate's or bachelor's degree. Given the increasing interest in radio courses evidenced by National Public Radio and some individual educational institutions, this situation may change rapidly.

Among the surveyed programs that use computer-assisted instruction (CAI), the primary focus is on basic mathematics and language skills. This narrow-range of subjects and the modest number of CAI programs in the survey both reflect the fact that, historically, few postsecondary organizations have used computers to serve students off campus. The size and cost of most computers have been major deterrents to off-campus applications.

However, the current proliferation of microcomputers has the potential to rapidly change this pattern. If this survey were conducted again in the near future, it would undoubtedly be able to include many more organizations offering currently available CAI software in subjects like mathematics, English, economics, biology and history to students off campus as well as on campus. Unlike CAI, computer-based instructional management (CBIM) approaches are used by the surveyed programs to support the delivery courses from across the entire undergraduate curriculum.

Much that has been said here about undergraduate audio and video instruction applies equally to adult continuing education. However, the range of continuing education subjects is broader, and more personal enrichment and coping skills subjects are included.

## Graduate Education

Among the 22 postsecondary organizations in the survey that employ electronic media in graduate instruction, far fewer academic disciplines are involved than at the undergraduate level. Education, engineering, business, and high technology subjects are most common. For graduate students learning at a distance, problems of providing access to research materials as well as to laboratory experiences (actual or simulated) may be somewhat ameliorated in the near future by combining technologies like microcomputers, videodiscs, videotex, and high speed facsimile.

## Professional Continuing Education

At the professional continuing education level telecommunications technologies are used to deliver many more academic subjects than is the case with graduate education. Among the surveyed programs, medicine, allied health, engineering and high technology, business, education, law and real estate are the most commonly cited professional fields.

When it comes to educational applications of telecommunications technologies, professional continuing education is perhaps the fastest growing and most competitive area. Since so many professional groups are mandated by their state governments and encouraged by their professional associations to stay current in their fields, and since professionals are likely to be relatively affluent, educational institutions, professional associations, and private businesses are actively competing to reach these learners by using technologies like satellite-to-cable networks, videotapes, audio teleconferencing, and video teleconferencing.

## Patterns of Technology Uses at Different Curricular Levels

The results of the survey make it clear that postsecondary educators are not only using all types of electronic media, but at different curricular levels they are relying more on some technologies than others. The patterns of technology use that emerge have some definite pedagogical implications for educators because they affect the ways in which students can interact with faculty and peers.

The vast majority (84 percent) of surveyed programs that offer undergraduate instruction employ noninteractive video and audio technologies such as broadcast television, videotape, radio, or audiotape to reach students, whereas only 43 percent use an interactive technology (other than regular telephone service). At the graduate and professional continuing education level there is approximately equal reliance on interactive and noninteractive technologies among the surveyed programs; the interactive technologies are more often used as the primary delivery vehicle and noninteractive media, such as videotape, are used as a secondary or supplemental media.

The reliance upon noninteractive media at the undergraduate level is easy to understand because technologies like open-broadcast television are capable of reaching large segments of the population for whom introductory level courses are likely to be the most appropriate educational experience. Likewise, the smaller scale and often more initimate interactive technologies like audio and video teleconferencing seem particularly well suited to graduate seminars or workplace environments where much of the learning is a function of interaction with experienced peers.

Even though the survey provides a snapshot rather than a moving picture of this topic, there does seem to be a growing trend among educators to employ interactive technologies at the undergraduate level, either by themselves or in combination with noninteractive technologies like videotape. As a result of the recent proliferation of statewide audio teleconferencing networks in such states as Nevada, Texas, Montana, Alaska, and Washington there are now many more programs using this technology to serve undergraduates as well as graduates and professionals. This undoubtedly reflects the need of these geographically expansive states to cost-effectively serve all types of learners.

In many cases the same credit courses are offered on a bilevel basis, thus enabling both undergraduate and graduate students to enroll and complete assignments of varying difficulty. The tendency to use these statewide systems for undergraduate as well as graduate and professional continuing education is also evident in two of the older audio conferencing networks—Kansas Regents Continuing Education Network (TELENET) and, to a lesser extent, the University of Wisconsin-Extension's ETN and SEEN networks. In addition to these interactive audio networks, interactive video technology is used by Kirkwood Community College (point-to-point microwave) and Columbus Technical Institute (interactive cable) to serve undergraduate students.

Because the roles played by faculty in courses delivered by interactive and noninteractive technologies are so different, the growing inclination of some educators to rely more heavily on interactive technologies for undergraduate education has important implications for curriculum development and the design of student support services. Since the role of faculty in this is so crucial, it will be dealt with separately in the next chapter.

## Patterns of Mixing Print and Electronic Media

There are numerous ways in which the surveyed programs differ in their reliance upon print and electronic media to convey their curricula. Some patterns do emerge from an examination of the 70 programs. However, there are probably as many exceptions as patterns to be found among them.

- **Undergraduate**

At the undergraduate level where the majority of programs rely heavily upon noninteractive media like broadcast television, radio, videotapes, and audiotapes, two relatively distinct patterns emerge. The first has been referred to as *electronic media-based courses with print components.* This pattern, which is common to most community colleges and many four-year colleges and universities, places considerable emphasis on broadcast media, moderate emphasis on print materials, and very little emphasis on classroom meetings (e.g., one to three meetings per semester). Video or audio segments generally vary from 26 to 30 half hours per semester (for a three-credit-hour course) and are used to convey a substantial amount of the curricular content in addition to motivating and pacing the student. Print components normally include a text, a study guide, and often a book of additional readings. Examinations and homework assignments are generally objective with varying emphasis on written essays.

The second approach, which can be described as *print-based courses with electronic media components*, has been taken by many of the four-year institutions that have adapted British Open University (BOU) courses or have programs somewhat similar to the BOU model. Included in this group are universities with a strong correspondence tradition that also use telecommunications. These institutions normally use between 5 and 15 half hours of video or audio per semester for a three-credit-hour course. Such courses rely heavily on a variety of print materials that usually includes a study guide, at least one textbook, and numerous books of extra readings. Some, like the University of Maryland's Open University, offer three hours per week of tutor-led optional classes, while others offer very few classes per semester. These programs generally require the student to complete numerous written assignments in addition to some essay tests.

- **Graduate**

At the graduate level reliance on electronic media varies much as it does at the undergraduate level. However, there is a more consistent emphasis on the use of print materials. Since more than half the surveyed graduate programs use interactive technologies, the classroom experience is generally combined with the content presentation.

- **Professional Continuing Education**

Professional continuing education courses generally rely heavily on the electronic media to carry the curricular content. Few programs are accompanied by print materials beyond those supplied by the faculty member with each presentation. There are exceptions such as the University of Texas Health Science Center at San Antonio—Teleconference Network of Texas and the American Bar Association, which both provide their students with extensive print materials.

## Cooperative Course Development Patterns

As more postsecondary organizations use some form of telecommunications technology to serve learners, there is a corresponding increase in collaborative efforts to design and develop instructional materials as well as to distribute them. Much of this cooperation takes place informally between two or more institutions or organizations, but increasingly it occurs within the context of a formal consortium. Whether such endeavors are local, like the Southern California Consortium for Community Colleges Television, or national, like the National University Consortium, this collaboration means that colleges and universities are increasingly willing to give up some decision-making autonomy regarding curriculum issues in order to obtain cost-efficiencies and, it is hoped, to improve the quality of instructional materials.

Some institutions also cooperate with private businesses in the development of courses of mutual interest. For example, Milwaukee Area Technical College has worked with Texas Instruments and the Heathkit Division of Zenith to develop television courses that meet the training needs of workers and the educational needs of students. Another example is Dallas County Community College District, which works cooperatively with numerous publishing companies in the production of video courses.

Among those postsecondary organizations that use electronic media to deliver graduate and professional continuing education to worksites, cooperation in both the selection and development of courses is common practice. For example, The Association for Higher Education of North Texas (TAGER) has substantial representation from local business and industry on its board of directors as well as on its advisory committees. Others like Medical Care Development, Inc. of Maine establish user groups of professionals from various medical specialties to determine what programming they want the network to carry. In another case, an industry-based membership organization called the Association for Continuing Education serves as a broker between universities and industries and manages to achieve agreement on the selection and development of courses designed specifically for employees.

There has been less reason for interinstitutional collaboration to produce or lease instructional materials among programs using interactive technologies because local faculty teach live courses on the networks much as they do in regular classrooms. Nevertheless, cooperative efforts do occur. For example, the staff of the Teleconference Network of Texas is working in cooperation with other medical educators to develop videotaped instructional materials that can supplement faculty presentations over audio teleconferencing networks. In the computer area, CONDUIT, an educational software supplier, is also experimenting with collaborative approaches to curriculum development.

## Trend Toward Flexible Designs for Courseware

None of the surveyed educational institutions that currently develop and market prerecorded video or audio course material, such as Dallas County Community College District or City-Wide College of Chicago, originally intended to be a national producer of curriculum materials. Rather, national marketing evolved out of a need to find additional sources of income to cover the costs of developing courses for their own use. As more courses, originally designed and produced to meet local needs, have been made available for lease or purchase by other institutions, there has been a growing recognition that the more flexibly a course is designed initially, the greater the likelihood it can be adapted readily by others to suit their specific local needs.[1]

This trend toward designing more flexible instructional materials is reflected in different ways. For example, some institutions in recent years have begun to organize the video (or audio) and print components of their courses into modules (e.g., 15 one-hour modules, 36 four- to five-minute modules) to facilitate adaptation by different institutions and faculty members. Two examples of this pattern are Miami Dade Community College's *The Art of Being Human* and Northern Virginia Community College's *Small Business Management* course. In addition, Tacoma Community College has divided many of its radio/audio courses into 20 to 30 15-minute modules to accommodate telephone access to audiotapes, a preference of many students. Central Piedmont Community College uses 10-30 minute video modules in approximately 150 courses in order to give faculty more options for using video in both on-campus and off-campus classes. At the College of San Mateo project staff designed their computer software and their academic curriculum materials to be flexible enough so students could make effective use of the computer, the videotape, and the workstation.

Further evidence that courseware used by more than one college needs to be designed to facilitate local adpatation can be found in the experience of two national consortia. Both the National University Consortium and the To Educate the People Consortium represent efforts to disseminate the cirriculum and delivery system of programs that originally evolved at individual institutions (the University of Maryland and Wayne State University, respectively). Both national consortia have established procedures to encourage member institutions to adapt existing courses and to actively participate in the design of new courses. This is done to increase the likelihood that both print and video course materials will respond to the needs of local institutions and to share the high costs of course development. By actively involving member institutions in the selection, design, and production of courses, both consortia are evolving more flexible approaches to curriculum development.

An emphasis on flexible course design is often one of the outcomes of the numerous cooperative instructional development arrangements that involve two or more individual institutions or local consortia. Because they normally rely on teams of content and technical experts from all, or most, of the participating institutions, they tend to design a course that serves a wide range of educational purposes.

As a result of this trend toward more cooperative development of instructional materials, incentives for organizations to experiment with flexible approaches to instructional design probably will continue to increase.

## Trend Toward Incorporating Skill Development Into the Curriculum

One of the ironies of using electronic media to extend educational access to previously unserved or underserved clientele groups is that these populations often are deficient in some of the basic skills such as reading, writing, and mathematics that are necessary to complete the courses satisfactorily. Some of the surveyed programs are responding to this dilemma by integrating skill development components into regular disciplinary-based or interdisciplinary courses. For example, WNET/Channel 13 of New York, in cooperation with seven local colleges and universities, integrated a writing skills component into an introductory humanities course offered to blue and pink collar workers. At Wayne State University, where the University Studies/Weekend College program primarily serves blue collar workers, faculty in the science and technology courses make special efforts to incorporate exercises that will help students develop computational skills necessary to learn the material.

Another approach to incorporating skill building into courses is to offer an entire course that focuses on a particular skill. For example, many colleges and universities use writing courses similar to Dallas County Community College District's *Writing for a Reason*. In addition to learning about writing skills, students who take this video course are required to complete and hand in numerous writing assignments, which are subsequently returned with faculty comments.

Institutions that are adapting British Open University courses and those that have strong correspondence education tradition, as Pennsylvania State University does, encourage the improvement of writing skills by requiring students to complete numerous essays as course assignments and as examinations. In addition to telephone contact, some of the communication between students and faculty is conducted via letters.

In some cases learners with deficient basic skills need to focus completely on a remedial curriculum. The PLATO computer-assisted instructional programs sponsored by the City of Baltimore, the University of Illinois, and St. Augustine's College, focus first on the basic skills before moving into the more advanced academic content or job training.

## Trend Toward Offering Bilevel Credit

Some of the surveyed programs use the same electronic media course components for students taking credit courses at various levels (e.g., lower- and upper-division undergraduate or undergraduate and graduate). By varying the print components and class assignments for students at different levels, colleges and universities are able to maintain appropriate academic standards while at the same time making more cost-effective use of scarce and expensive electronic media resources. San Diego TV College, for example, offers bilevel courses for both community college and university students over its extensive cable network. Bilevel credit for undergraduate and graduate students is also available to students who use the University of Nevada UNITE and the Kansas TELENET audio teleconferencing systems. In addition, many of the open broadcast television courses offered by the University of South Carolina are available for both undergraduate and graduate credit.

### Summary

- Educators are using electronic media to deliver instruction at the basic skills, undergraduate, professional, and adult continuing education levels.
- Undergraduate curriculum conveyed by noninteractive video and audio technologies recently has included more courses in the sciences, business, and vocational/technical fields; in the past almost all courses were in the social sciences and humanities.
- Many nonprofit and for-profit organizations are using electronic media to offer continuing education to professionals; intense competition and cooperation characterize this expanding sector of postsecondary education.
- Noninteractive technologies are much more commonly used in undergraduate programs than in graduate and professional continuing education programs where use of interactive technologies is extensive.
- Interactive technologies like audio teleconferencing are increasingly being used to serve undergraduates as well as graduates and professionals.
- Educators are exploring various patterns of mixing print and electronic media.
- Postsecondary organizations are finding many reasons to cooperate in developing the electronic and print components of instructional materials; colleges, universities, businesses, and industries, are involved in this effort.
- Educators are experimenting with various strategies for designing courseware that is sufficiently flexible to be used for different purposes and by numerous institutions.
- Some programs are devising strategies to deal with students' needs to develop skills (e.g., writing) in addition to mastering academic content.
- Some programs use the same electronic media course components for both graduate and undergraduate students as a way of reducing costs; assignments differ for each level of instruction.

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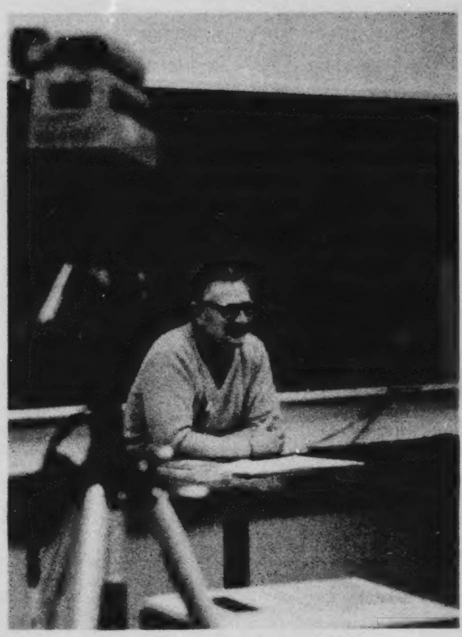
[1] For a discussion of the advantages of designing flexible instructional curriculum materials, refer to: Robert H. McCabe, "The Economics of Television Centered Courses," in Roger Yarrington, *Using Mass Media for Learning*. Washington, D.C.: American Association for Community and Junior Colleges, 1979, pp. 34-35.

# 5. FACULTY ROLES



Video taping on-campus classroom lecture for distribution to off-campus students
-Eastern Oregon State College

**How are faculty involved in the programs that use telecommunications technologies?**

Faculty in the surveyed programs are involved to varying degrees in selecting, designing, developing, and delivering instructional materials. Many are also centrally involved in providing student support services.

## Curriculum Development

The manner in which faculty are involved in developing curricular materials is probably the single most important factor affecting the quality of telecommunications programming. The nature and extent of that involvement is determined by a combination of factors which include:

- the technology used to deliver the instruction
- whether the curricular materials are leased (or purchased) in a prepackaged form or developed by local faculty
- the curricular development skills the faculty member(s) bring to the curriculum development process
- the prevailing organizational approach to curriculum development of the college or university (e.g., individual faculty members, teams, committees)
- whether the course materials are developed by a single institution or two or more organizations in a collaboration

Among progams that rely on noninteractive technologies like open broadcast television, the course development process differs somewhat depending on whether the course is for local use only or for national distribution as well. If the institution produces prerecorded video or audio courses for *national distribution* as well as for local use, faculty are usually most actively involved in the early course design stages as members of formal faculty committees and/or course design teams composed of professionals who have a variety of academic and technical skills. Because the process of developing video courses for national distribution requires the combined skills of many experts and the use of high quality production studio facilities, it usually is lengthy, complex, and expensive. As a course moves into the final production stages, local faculty may be less involved, and someone with acting skills and/or a more national reputation may be selected as the on-camera presenter.

In contrast, institutions that produce prerecorded video or audio courses for *local use only* are more likely to rely on one person or a small group of faculty content experts who work with local media technicians. This process is likely to be relatively informal, varying considerably from course to course depending on expertise and personalities. Local faculty almost always serve as the on-camera presenters in such situations.

Among programs that rely on interactive technologies, the curriculum development process differs depending on whether the instruction is computerized or noncomputerized. Faculty involved in developing curriculum for *computerized* instruction often operate in a highly individualistic and informal fashion. Depending on their level of expertise in computer programming and curricular design, faculty may choose to work as part of a team. In either case, considerable training is required.

By comparison, for educators employing *interactive* audio and video technologies, the curriculum development process requires much less training and it differs little from conventional classroom preparation. Faculty teaching on interactive networks need only make modest adjustments in their style of presentation in order to encourage student participation.

Many postsecondary institutions that use telecommunications technologies produce few of the instructional materials they use and therefore need to lease or purchase prepackaged materials from other educational or commercial organizations. Faculty at these "user" institutions generally participate in selection committees that evaluate altenative instructional materials in terms of local needs. Except for a few institutions that use only their own instructional materials, almost all the surveyed colleges and universities lease or purchase some prerecorded or packaged programming that must first be approved by faculty selection committees.

The course selection and development process is somewhat more complex when the instruction is to be delivered to worksites. In such cases faculty generally share the decision-making responsibilities with industry advisory committees, individual employers, or user groups composed of employees. This is particularly true in graduate and professional continuing education courses.

## Delivery of Instruction

Faculty that make use of interactive audio and video technologies as a primary delivery mode alter their presentations from regular face-to-face classroom situations only in small ways, if at all. For example faculty who teach on an audio teleconferencing network may need merely to adjust their presentation to compensate for the absence of visual communication. They may also need to prepare additional print and visual materials (slides, overhead transparencies, videotapes) ahead of time for distribution to remote sites. Teaching on a two-way video network may require fewer changes in the faculty members' mode of operation, but they still must learn to involve remote learners effectively in interactive exchanges.

Conversely, faculty teaching in courses that depend heavily on prerecorded programming are able to make only modest adjustments in the prerecorded video or audio components but can make more substantial changes in the print components. However, they work basically within the framework of the course as originally designed.

The extent to which faculty are involved in the delivery of computer-based instruction depends on a number of factors including the original design of the computer program, the setting in which the learning takes place, and the student's level of motivation and skill. In some cases, faculty members rarely need to interact with their students. More often, the computer is used to free faculty so they can assist students individually.

Faculty in virtually all the surveyed programs are available to their students by mail or by telephone. Many programs provide a toll-free telephone number for students to call program staff or faculty. Most programs also make provisions for face-to-face meetings between students and faculty in individual or group sessions. Faculty at many of the surveyed institutions travel to prisons and jails to provide such contact for incarcerated students.

Most programs that rely on noninteractive technologies to deliver instruction make extensive provisions for additional student support services (e.g, field trips, review classes, newsletters, computerized feedback, etc.). These services are usually considered essential components of the course and often involve considerable faculty time.

In contrast, programs in which students and faculty interact in real time during course sessions generally provide far fewer student support services. There are notable exceptions to this pattern including, California State University at Chico and Kirkwood Community College among others. This pattern of providing fewer student support services undoubtedly reflects the historical tendency of interactive networks to serve graduate and professional continuing education students who are highly motivated and, in many cases, not pursuing credit toward a degree. The opportunity to ask questions of the instructor or to make comments at the same time the course content is being presented presumably diminishes the need for additional student support services. As more interactive networks are established, and if the trend toward using them to offer undergraduate instruction continues, we might see faculty and staff experimenting with a wider variety of student support services.

## Patterns of Faculty Involvement and Faculty Resistance

When asked to detail problems encountered by their programs, the staff members of the 70 surveyed programs most often cited a pattern of faculty resistance to the use of telecommunications for instructional purposes. Some practitioners, however, have found ways to reduce faculty resistance and increase faculty involvement. Before briefly describing some of these remedies, it is worth mentioning a few things about the sources of such resistance.

Just as in any profession, there are always some faculty members who resist change in any form. None of the surveyed staff had a specific strategy for dealing with this hardcore resister category, at least not one they were willing to discuss for the record. Other faculty members object to the use of the technology for specific reasons: "it's impersonal," "it entertains rather than informs," "it diverts resources that could be spent on salaries, libraries, etc.." or even "it threatens my job." Still other faculty members do not have strong opinions about educational applications of electronic media but feel vaguely uncomfortable because they are unfamiliar with the technology. On the other hand, some faculty members and more frequently, some administrators, have unbounded and uncritical enthusiasm for the "potential" of the technology to solve every imaginable educational problem.

For the program manager who recognizes both the capacity and the limitations of various technologies to serve learners, the "super-enthusiasts" in academia and in the communications industry can cause as many or more difficulties as those who resist the technology. The prevailing strategy among the staff of the surveyed programs seems to be to ignore the hardcore resisters, encourage the muffled support of the super-enthusiasts, and focus on the faculty members who are mildly supportive of it, uncomfortable with it, or moderately opposed to it.

Of course, not all strategies employed by the staff of the surveyed programs will prove effective in every college or university. Neither will proven strategies for involving faculty compensate for inappropriate educational applications of the technologies. Nevertheless, a number of strategies revealed by the survey have contributed to reduced resistance and effective involvement of faculty. Some of the strategies are:

- Make provisions for active oversight and involvement by departmental faculty in all decisions that affect the academic quality of the program. This strategy is used effectively by Los Angeles Community College District and Central Peidmont Community College, among others.
- Involve prominent faculty members in the telecommunications program from the outset. At the University of Nevada two of the first faculty to teach over the UNITE audio teleconferencing system were highly respected members of the Graduate Council who were known to be initially skepti-

cal about using the technology to teach graduate courses to learners in remote sites.

- Involve as many full-time rather than part-time faculty in the program as possible. Organizations that have found that this reduces faculty resistance include Southern California Consortium for Community College Television, Pennsylvania State University, and Wayne State University.
- Design the technology to be as uncomplicated and unobstrusive as possible. This strategy has worked well for many interactive audio and video networks that require faculty to teach a live class using the technology. The Association for Higher Education of North Texas (TAGER), California State University at Chico, Medical Care Development, Inc., and Queensborough Community College are four of the programs that have paid special attention to this strategy.
- Provide faculty with an adequate orientation to the technology and the entire delivery system. Most of the surveyed programs conduct some form of formal or informal orientation. Some organizations that place special emphasis on faculty orientation are the Bay Area Community College Television Consortium, Kirkwood Community College, the Kentucky Council on Higher Education, the University of Texas Health Science Center at San Antonio, and the University of Wisconsin-Extension.
- Use the technology to serve remote learning sites. The saving of time and money by faculty who no longer need to commute to remote sites is readily appreciated. This has been the experience of many institutions including California State University at Chico, University of Illinois (Engineering), and the University of Wisconsin-Extension.

The bottom line for many programs seems to be that faculty members who get involved in using the technologies generally are very supportive. There also seems to be a consensus that faculty resistance is a problem that is never completely overcome; it is a problem that does not respond to the quick-fix but requires long-term attention.

Videotaping an on-campus class
-Association for Media-Based Continuing Education for Engineers, Inc.

**Summary**

- Faculty are centrally involved in the process of selecting, designing, developing and implementing courses at most of the surveyed programs.
- The nature of faculty involvement in course development is shaped by a combination of technological, curricular and organizational factors.
- Faculty involved in delivering instruction via telecommunications technologies play a wide variety of traditional and non-traditional roles.
- Faculty resistance to the use of telecommunications technology is a major problem for most programs in the survey; some programs have devised effective strategies for overcoming, or at least diminishing, resistance and encouraging faculty involvement.

# 6. DELIVERY SYSTEM

Public library learning site
-City-Wide College of the City Colleges of Chicago

**How are electronic media, print media, and student support services integrated in programs using telecommunications technologies?**

The term *delivery system* is used throughout this book to refer to the various combination of print media, electronic media, and student support services that are used by an educational program to serve learners. Since one of the criteria for inclusion in the survey was that programs have the capacity to serve learners off campus as well as on campus, most of the programs involve multiple delivery sites spread over geographic areas of various size. For example, surveyed programs deliver services to communities, metropolitan areas, portions of states, entire states, regions, the entire country, and, in a few cases, beyond. In many cases the electronic media component of the programming is delivered directly into the student's home; in other cases various community sites, in addition to the college campuses, are available for individuals or groups of students.

Programs that rely heavily on noninteractive technologies like broadcast radio or television often use both the student's home and community learning sites. With only a few exceptions, programs that rely on interactive audio, video, or computer technologies use on-campus and remote learning sites but do not use individual student's homes. Currently, there are only two ways that students in the surveyed programs can participate in live interactive educational programming: by using their telephone to call in to the point from which the program originates or by subscribing to a cable television system with interactive capacity. Technologies such as microcomputers and videotex, used separately and in combination, are expanding opportunities for live interactive programming in the home.

## Delivery Sites

In conversations about the working adults they served, staff members of the 70 programs stress the fact that *convenience* is the single most important consideration affecting adult learners' decisions about whether, where, or when to get involved in education. This suggests that if an educational program is not designed to fit easily into the lives of busy adults with family, job, and community responsibilities, its likelihood of success is not great.

One of the most consistent patterns emerging from the analysis of these 70 programs is the use of convenient community sites for the delivery of instruction and student support services. In some cases colleges rent available space in the community, but more often there is a cooperative arrangement in which facilities and even services are made available to colleges for little or no charge. One way to gain appreciation of postsecondary educators' efforts to make opportunities for learning more convenient is to review a list of some of the types of community sites used by the surveyed programs:

American Indian centers
Broadcast stations
CETA centers
Chambers of Commerce
Churches
City halls
Courthouses
Government office buildings
High schools
Hospitals
Industries
Job Corps sites
Main campuses
Military bases
Prisons
Public libraries
Satellite or branch campuses
Senior citizen community centers
Senior citizen residential facilities
Social Security Administration offices
Union Halls

Many interactive video and audio networks use such remote locations as group viewing or listening sites. Students come together at prearranged times to participate in a class that may electronically link others from all over the community, state, or country. Audio or video cassettes of interactive sessions are usually made available to students at the learning sites or via the mail from the organization originating the programming. Sites are usually staffed on a part-time basis by someone familiar with the equipment. In many of these interactive systems, faculty have the option of initiating their class presentation from any site on the network. This feature encourages faculty to travel to different sites to meet students.

Remote delivery sites of programs that rely on noninteractive technologies such as broadcast television typically provide students with access to all the audio and/or video cassette recordings and print materials associated with the course. Most often these sites are colleges or public libraries where staff assistance and study facilities are available. Many of the surveyed programs have extremely cooperative relationships with public library systems that contribute things such as staff time, space, equipment and special services. Some examples are Coastline Community College, Northern Virginia Community College, City-Wide College of Chicago, and West Virginia College of Graduate Studies.

The interactive audio and video networks tend to have the greatest number of remote learning sites. For example, the University of Wisconsin—Extension has 200, the Teleconference Network of Texas has 90, Kansas TELENET has 34, the University of Washington's WETNET has more than 20, and Kirkwood Community College has 5. Most of the programs using noninteractive technologies are able to reach students in their homes and therefore seem to have fewer remote learning sites. The University of Maryland has 15, Eastern Oregon State College has 10, and City-Wide College of Chicago has 9. Central Piedmont Community College, which uses over 200 learning sites, is an exception to this pattern.

## Providing Learners with Print Materials

One of the biggest problems facing programs that rely on remote learning sites or delivery into students' homes is making adequate print materials available to the students (e.g., faculty handouts, books of readings, research materials). One way of solving the problem is to use libraries as the learning sites as they do at City-Wide College of Chicago. Another way is to mail extensive print materials to students before interactive classes as is the practice with the Teleconference Network of Texas. The SURGE program at Colorado State University arranges with public and college libararies throughout the state for full borrowing privileges for its business- and industry-based students. The School of Textiles at North Carolina State University encourages each industry that employs students to provide a reference library at the worksite.

One of the more elaborate approaches to dealing with this obstacle to education at a distance is employed by West Virginia College of Graduate Studies. Students in this program have access to a computerized catalog listing of all the books in the statewide public library network and an on-line research data base. Books can be shipped to the students' local libraries from anywhere in the state. Students can have books mailed to them directly if they cannot get to one of the satellite learning centers. California State University at Chico uses a similar approach but adds to it a facsimile machine capable of providing copies of some materials directly to the remote learning sites.

A related problem faced by many programs is obtaining and distributing books to learners located away from the campus. The sheer logistics of dealing with numerous publishers, out-of-print books, late deliveries, limited inventories, and changing prices is high on the list of headaches for many program staff. These problems are particularly difficult for programs that are very heavily print-oriented.

## Delivering Electronic Media to Learners

Most of the prerecorded broadcast video and audio courses are available two half-hours per week (for a three-credit course) throughout the semester. Repeats are scheduled on cable television and unlimited repeats are available in cassette form at learning centers. One exception to this pattern is Wayne State University, which offers five half-hours per week of video programming for a four-credit-hour course.

Students taking courses on interactive audio and video networks may spend from three half-hours per week to a single two- or three-hour program each week. In addition to making audio or video tapes available for replay, as is often the practice, faculty at the College of Great Falls offer the same audio teleconference presentation a second time during the same week for the convenience of students who miss the initial teleconference.

Instruction that relies on computer terminals is, at least potentially, available 24-hours a day. In practice, some programs have difficulty scheduling enough time on the computer for all their students during hours the buildings are open. In addition, computer terminals at most institutions are available only on campus. This can be particularly frustrating when faculty know the students need and want additional access to the computer terminals. As microcomputers become more available in places like public libraries, prisons, senior citizens centers, high schools, industries, and the home, the potential for more convenient student access to this technology increases immensely.

## Classroom Instruction

Very few of the interactive audio and video networks provide additional classroom experience for their learners either on or off the network. Some do use their networks for student/faculty conferences, student discussion groups, or user group meetings. It is common for broadcast television and radio courses to include from one to four face-to-face classes per semester, either on campus or at remote learning sites. Policies regarding optional versus required class attendance vary from institution to institution. Programs that are adaptations of the British Open University model usually offer one three-hour optional tutor-led class per week. At Wayne State University and at many of the To Educate the People Consortium member institutions students and faculty discuss the content of the television courses during a portion of their four-hour-long weekly workshop courses.

## Counseling and Information Services

All undergraduate and graduate programs and most professional continuing education programs make counseling and information services available to all students regardless of whether they learn on or off campus. Unfortunately, in the majority of cases these services are only available on the campus. Programs such as Kirkwood Community College and Eastern Oregon State College, however, make efforts to reach off-campus learners by having a circuit-riding counselor visit each of the remote learning sites. At Queensborough Community College homebound and handicapped students are visited regularly in their homes by staff counselors and occasionally by faculty. California State University at Chico provides its students at remote rural sites with constant telephone access to faculty and support staff (including counselors) at the main campus.

WYES/Channel 12, the public broadcasting station in New Orleans, was the only surveyed program with the sole mission of using electronic media to provide information and counseling to potential adult students. Another approach to providing information and counseling to potential learners which has recently become operational on a national scale is Comp-LEARN, a program of the Council for the Advancement of Experiential Learning (CAEL). It helps learners prepare for assessing knowledge and skills acquired experientially. With the proliferation of microcomputers such services are likely to be more numerous and accessible in the future.

## Additional Student Support Services

Since students and faculty cannot interact during the video or audio presentations of a program that uses noninteractive technologies, and since most of the students are undergraduates who may need more support and encouragement, these programs generally make provisions for many student support services. The nature and extent of these support services vary considerably depending on the commitment and resources of the sponsoring institution.

Institutions build interaction into their programs with the following:

- formal class meetings or laboratory sessions with instructor
- telephone calls initiated by faculty/staff
- letters, or cards, newsletters from faculty and staff
- review sessions for exams
- arranged study sessions for groups of students
- telephone office hours for faculty
- face-to-face academic advising
- field trips with faculty
- individualized feedback on exams, papers
- computerized feedback on exams
- orientation session with faculty/staff

Additional support services that do not necessarily involve interaction with the course instructor are offered by many of the surveyed institutions. These include:

- career information
- career counseling
- personal counseling
- academic advising
- academic tutoring in basic and academic skills
- referral to other educational options
- referral to community agencies
- registration by mail, telephone, or in person
- continuous registration for independent study
- orientation to the institution
- orientation to learning via telecommunications in general
- orientation to the specific telecommunications program
- access to the library
- experiential learning opportunities (e.g., take-home kits, laboratory sessions, field trips, speeches, etc.)
- assessment of prior learning
- credit for prior learning
- instruction on how to prepare for prior learning assessment

Some of the provisions for special student populations made by the surveyed programs include:

- bilingual video and audio instruction
- bilingual counseling
- bilingual print materials
- captioned video for the hearing impaired
- braille print materials for the print handicapped
- large print used in course materials for older adults and the print handicapped
- audiotapes of tests, term assignments and video segments for the print handicapped
- radio reading services for the print handicapped

**Summary**

- For the adults in most of the surveyed programs the decision to participate in an educational experience is largely determined by how conveniently they can fit it into their busy lives.
- Telecommunications technologies offer educators opportunities to make learning more convenient for students regardless of whether they are enrolled in on-campus or off-campus courses.
- Most surveyed programs include various community facilities and organizations in their delivery systems in order to make the educational experience more convenient for the learners.
- The problem of providing distance learners with books and reference materials is one of the most difficult faced by many of the surveyed programs; some programs have devised strategies for ameliorating the problem.
- Programs that rely primarily on noninteractive technologies employ numerous strategies to build student/faculty interaction into the delivery system.
- The range of student support services offered by the surveyed programs is very extensive.
- Some of the surveyed programs have devised support services designed specifically to address the needs of special clientele groups.
- Many surveyed programs are experimenting with ways to further individualize the instruction they provide students.
- Integrating adequate counseling and information services into delivery systems is a problem for many programs.

- telephone typewriters (TTY) for the hearing impaired
- visiting counselors for the homebound and handicapped
- special delivery of instructional materials for the homebound and handicapped
- instructors and counselors who teach in prisons and jails
- group viewing sites for older adults at senior centers
- special provisions for shift workers
- flexible delivery options for rural areas with small class sizes

## Trend Toward Individualizing Instruction

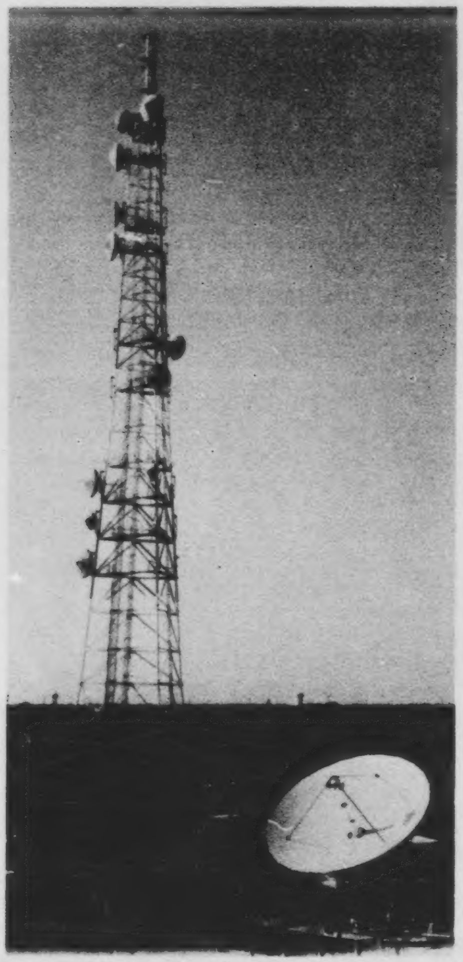
The staff of many of the surveyed programs indicated that their future plans include efforts to individualize more effectively the instruction they offer via telecommunications. Most plan to use computer-based instructional management systems to provide more specific feedback to students based on their responses to homework assignments and tests. Miami-Dade Community College, Coastline Community College, Rio Salado Community College, and Pennsylvania State University are among the institutions that have already integrated such systems into their curricula development and delivery system processes.

Perhaps programs that use computer-assisted instruction (CAI) are able to provide the highest level of individualization without entirely sacrificing face-to-face contact with faculty. Saint Augustine's College, the City of Baltimore Mayor's Office of Manpower Resources, and the University of Illinois at Champaign-Urbana all use PLATO computer terminals to indivdually assist their adult learners (welfare mothers, unemployed adults, prisoners) to upgrade their basic skills. In addition, CAI is sometimes tailored to the specific needs of a particular group of learners. For example, the staff of the College of San Mateo have developed CAI courseware to upgrade the work-related skills of workers in the electronics industry.

Some of the surveyed programs are individualizing their instruction by developing or expanding study opportunities with flexible time limits. For example, Northern Virginia Community College's Extended Learning Institute relies heavily on print-based courses, as well as radio and television courses, in order to offer self-paced instruction with more flexible time limits. In addition to expanding their reliance on print media, institutions like Milwaukee Area Technical College and City-Wide College of Chicago make the electronic media course components more convenient for self-pacing by placing videotapes and audiotapes in college and public libraries.

Some of the four-year institutions that have longstanding correspondence education traditions enjoy certain advantages when it comes to individualizing instruction that is delivered by electronic media. Not only do they already have in place the logistical arrangements necessary to support distance learners (e.g., book distribution, flexible registration procedures) but their faculty generally are much more accepting of delivery systems that reach learners at home or in the community. Such institutions also have the advantage of using the electronic technologies to compensate for shortcomings in traditional correspondence procedures and vice versa. Pennsylvania State University and the University of Minnesota are two examples of institutions that are making considerable effort to combine the advantages of correspondence study and electronic media to provide more individualized treatment for their learners.

# 7. ENROLLMENT AND FINANCES



Microwave tower and satellite earth station
-The Association for Higher Education of North Texas (AHE)

## What are the enrollment and financial figures for the surveyed programs?

Up to this point in our search for generalizations about patterns and trends among postsecondary applications of electronic media, the survey data have revealed various consistencies that help to make this complex field a bit easier to understand. Although some patterns do emerge from an analysis of the enrollment and financial figures, it is difficult to obtain relevant data about such activities that are sufficiently comparable to support many tidy, or even untidy, generalizations.

In the abstract, there is something appealing about the prospect of combining enrollment and financial figures for each program to determine which are most cost-effective. In reality, it would require extensive resources to conduct a sufficiently specialized and detailed study of the topic even to begin to support such a comparative analysis. Since the survey was not designed to support in-depth analysis of such data, we are only able to report annual enrollment and the cost of operating a program on an annual basis. This is an inadequate basis for making comparative assessments.

There are many factors that complicate efforts to use enrollment and financial data to make comparisons of programs. Some of these factors are listed at the end of the enrollment and finance sections of this chapter.

## Enrollment

Among the undergraduate programs in the survey that employ noninteractive technologies such as broadcast television and radio, enrollments in telecommunications courses at individual institutions can be as high as 13,000 (Coastline Community College) or as low as 300 (New York University). Some examples of annual enrollments within this range are:

| | *Approximate 1980-81 Enrollment* |
|---|---|
| Dallas County Community College District | 9,000 |
| Los Angeles Community College District | 7,000 |
| University of South Florida | 4,000 |
| Miami-Dade Community College | 2,600 |
| University of Maryland | 2,500 |
| University of Minnesota | 930 |
| University of Nebraska | 580 |

In general, the community colleges that have made a major institutional commitment to the use of telecommunications technologies have the largest enrollments. There are, of course, many institutions with more modest enrollment totals. The survey includes an overrepresentation of institutions with large enrollments because the selection criteria (see Appendix A) emphasize noteworthy features and practices characteristic of some of the larger, more well-established programs. The *1981 Higher Education Utilization Study* reported an average enrollment of 678 per college among institutions using television to deliver courses. As the authors of the study point out, this figure, if taken by itself, can be misleading since the median was 100 and the mode was 20 for the same category. These figures reflect a pattern of large enrollments at some institutions and much smaller enrollments at many others.[1]

Among consortia offering undergraduate courses via noninteractive technologies, the enrollment figures for 1980-81 ranged from the approximately 26,000 generated by the 34 members of the Southern California Consortium for Community College Television to 863 generated by the 15 members of the more recently formed National University Consortium.[2] Some examples of annual consortium enrollments within this range are:

| | *Approximate 1980-81 Enrollment* |
|---|---|
| Bay Area Community College Consortium (24 members) | 5,500 |
| Eastern Educational Consortium (47 members) | 2,500 |
| To Educate the People Consortium (18 members) | 2,300 |
| San Diego and Imperial Counties Community College Association (13 members) | 1,800 |
| Maryland Center for Public Broadcasting-College of the Air (19 members) | 1,600 |

The instrument used in this survey was not intended to determine whether enrollments at consortium member institutions differ from those at nonconsortium member institutions. However, the *Higher Education Utilization Study* did report that, among institutions using television to deliver courses, consortium members offered 50 percent more courses and enrolled 140 percent more students than did nonmembers.[3]

Most of the individual institutions and consortia referred to earlier in this section participate to some extent in the Public Broadcasting Services' Adult Learning Programming Service, which makes video courses available to educators. In its first year of operation, the Adult Learning Programming Service reported more than 53,000 enrollments at over 555 participating institutions.

Among the undergraduate programs employing interactive audio, video, or computer technologies, the range of enrollment figures is not as great as with those using noninteractive technologies. Enrollments range from Kirkwood Community College with 2,000 to Columbus Technical Institute with 45 on the interactive Qube system (in addition to more than 600 using videotapes). Some examples of annual enrollments within this range are:

| | |
|---|---|
| California State University at Chico | 712 |
| College of San Mateo | 170 |
| Queensborough Community College | 68 |

Among the surveyed programs employing interactive technologies to offer professional continuing education, 1980-81 enrollment figures varied from 36,000 at the University of Wisconsin-Extension to 125 at the University of Illinois (Electronic Blackboard Communications System). Enrollment figures for many of these programs are difficult or even impossible to obtain. Medical networks like Medical Care Development, Inc. (MCDI) and the Teleconference Network of Texas (TNT) have enrollment figures for credit courses offered over their systems but they have more difficulty maintaining exact enrollment figures for programming offered for continuing education credit. MCDI reports 200 college credit enrollments and 15,000 attendees (one person for one program regardless of length), while TNT reports 60,000 student contact hours in addition to 100 credit enrollments. Assessing actual learner participation is even more difficult for organizations like the American Bar Association, which distributes programming via videotape; ABA estimates more than 100,000 lawyers view their tapes each year.

### Completion Rates

Data on the percentage of students completing courses that employ telecommunications technologies do not easily lend themselves to comparison either. The primary reason is that institutions have different ways of defining course completion. In addition, the incentives for students to complete all the courses for which they register is not the same at institutions that charge tuition and those that do not.

Not surprisingly, the data indicate higher completion rates among institutions charging tuition. Completion rates are also hgiher at the graduate and professional continuing education levels where students are presumably more highly motivated. Higher completion rates are also found in programs in which a large percentage of students are enrolled concurrently in traditional on-campus, as well as electronic media, courses. Apparently students for whom the campus is a convenient place to learn are more accustomed to the academic routine and have more incentives to complete courses than do many students learning in remote locations. It is probably safe to assume that those taking some courses on campus are also more likely to be committed to completing a degree program.

Among the surveyed undergraduate programs using noninteractive technologies, the average completion rate seems to be between 60 to 65 percent; the range extends from 40 to 90 percent. Graduate and professional continuing education programs report completion rates between 82 to 100 percent, with the average somewhere near 95 percent. Most consortia do not bother to maintain records of completion rates because there is so much variation among their member institutions.

### Variations in Enrollment Data

Some of the factors that complicate efforts to generalize about or compare enrollment figures are listed below:

- Some programs operate on a year-round basis; others operate only during the academic year.
- Enrollments are recorded at various times during the semester or term at different institutions (e.g., fourth week, tenth week, end of the semester).
- Attendance records of students in courses using telecommunications technologies are not broken out separately at some institutions.
- Some programs that use electronic media do not have separate records readily available for undergraduate, graduate, or continuing education courses.
- Programs with independent study options often have flexible or continuous registration policies that make it difficult to describe enrollment in traditional terms.
- Some programs offering professional continuing education courses have no way of maintaining records of those who use their programming.
- Some programs use contract hours rather than credit hours to refelct learner participation.

## Finances

The overall annual budget of programs in the survey varies from approximately $2.5 million for the Indiana Higher Education Telecommunication System (IHETS), which serves as a higher education telecommunications utility for virtually all institutions in the state, to programs like those at the American Dietetic Association, the University of Nevada, North Carolina State University School of Textiles, and Tacoma Community College with total budgets ranging from $20,000 to $45,000. Annual budgets for most of the surveyed programs run between $100,000 and $750,000. Only a handful of the 70 programs have budgets exceeding a million dollars a year and less than 10 have budgets under $100,000.[4]

Financial arrangements within the surveyed consortia vary considerably. The most common pattern is for the member institutions to contribute an annual membership fee that varies from $400 to $10,000.

Within the same consortium, membership fees may vary depending on the size of the institution and/or the number of students enrolled in consortium courses. Institutions participating in San Diego TV College and the Maryland College of the Air pay no consortium fees; they pay only on the basis of the number of their students taking television courses.

However, not all the consortia are supported by membership fees. In the case of two consortia (Indiana Higher Education Telecommunication System and Kentucky Council on Higher Education), participating institutions pay no fees for the services they receive from their respective state-funded agencies. Member institutions of the University of Mid-America, which was (until the fall of 1982) supported primarily by funding from the National Institute of Education, actually received funds as a part of their participation in the consortium. In another case, the To Educate the People Consortium has devised an elaborate resource-sharing arrangement in which the consortium awards modest grants to help member institutions establish their programs. Once underway, these programs reciprocate by providing funds and/or services to help other member institutions initiate their programs. The initial risk capital for the resource-sharing arrangement was provided by the Fund for the Improvement of Postsecondary Education.

### Funding Sources

The 70 programs included in the survey are funded through a variety of mechanisms. Many are self-supporting based on tuition, and, in some cases, income from the lease or sale of course materials to other organizations. Others are underwritten by institutional or state funds.

Funding agencies have awarded grants to many of the surveyed programs. Among the agencies providing such support are the following:

Alfred P. Sloan Foundation
Appalachian Regional Commission
California Worksite Employment Training Act
Carnegie Corporation of New York
Comprehensive Training and Employment Act (CETA)
Department of Labor
Fund for the Improvement of Postsecondary Education (FIPSE)
Kellogg Foundation
Murdock Foundation
National Endowment for the Humanities (NEH)
National Institute of Education (NIE)
National Science Foundation (NSF)
National Telecommunications Information Administration (NTIA)
Office of Telecommunications Demonstration (U.S. Department of Education)
Title III of the Higher Education Act
Veterans Administration (VA)

### Variations in Financial Data

Some of the factors that make it difficult to generalize about, or make comparisons of, the financial characteristics of educational programs employing telecommunications technologies are listed below:

- Variations in state funding formulas for courses delivered by electronic media make it difficult to compare programs with each other or with traditional programs.
- Many programs obtain services contributed from community organizations (e.g., television stations that provide air time).
- Many programs obtain services from other

organizational units within their institution that are not explicitly reflected in the program's budget figures (e.g., course production support from audio-visual experts on campus).

- In some cases faculty are hired on specific contracts and in other cases regular faculty teach telecommunications courses as part of their normal load; in the latter case salary expenses may or may not be reflected in the program budget.
- Some programs operate entirely on funds from granting agencies.
- Some organizations are public television or radio licensees in addition to offering educational programming, therefore the budgets for the two functions are not clearly differentiated.
- Some programs are managed on a part-time basis by administrators or faculty whose salaries are paid out of other budgets and are not charged against the program.
- Some programs obtain course development funds on a project-by-project basis; therefore, there is no consistent figure to report for the costs of courseware production.
- A few institutions have so thoroughly integrated telecommunications programming into the regular academic program that they maintain no separate budget figures.
- Some programs are willing to reveal information about their operational budget but not about their course production budget; a few refuse to give out any financial information at all.

Audio teleconferencing using slides
-University of Texas Health Science Center at San Antonio

## Summary

- Differences in institutional policies and practices make it difficult to compare enrollment and financial data.
- Among the undergraduate programs using noninteractive media, enrollments ranged from 300 to 13,000.
- Consortia account for a large proportion of the enrollments in this field; consortia members generally seem to have higher enrollments than nonmembers.
- It is difficult to keep track of learner participation in professional continuing education programs that use electronic media.
- A number of factors influence course completion rates among the surveyed programs.
- Completion rates are much higher in graduate and professional continuing education programs than in undergraduate programs.
- Because of the survey selection criteria, a larger proportion of well-established programs with sizable enrollments and budgets are included in this study.
- The annual budgets of the surveyed programs range from $20,000 to $2.5 million.
- Financial support for consortia come from a variety of fee- and resource-sharing arrangements.
- Numerous funding agencies have provided financial support for many of the surveyed programs.

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[1] Peter J. Dirr, Joan H. Katz, and Ronald J. Pedone, *Higher Education Utilization Study, Phase I: Final Report.* Washington, D.C.: Corporation for Public Broadcasting, 1981, pp. 9-10.

[2] Both Coastline Community College and Los Angeles Community College District, which were included in the preceding discussion, are members of the Southern California Consortium for Community College Television.

[3] Dirr, Katz and Pedone, 1981, p. 24.

[4] Again it should be pointed out that because of the survey selection criteria, larger, more well-established programs tend to be overrepresented and programs of a more modest scale are underrepresented.

# 8. BEYOND CURRENT PRACTICE: PROBLEMS AND POSSIBILITIES

Video control room
-The Association for Higher Education of North Texas (AHE)

Where do we go from here? Educators may differ sharply in their attitudes toward the increasing level of telecommunications activity in postsecondary education. Few, however, would conclude that the current technology explosion is unlikely to affect future developments in their profession. The exact shape of that future is still a matter for conjecture. This chapter presents one view of both the problems and possibilities this field poses for the future of postsecondary education.

## Problems Facing Postsecondary Education

Integrating electronic media into postsecondary education is a complicated process, and it can present many problems for those who attempt to make it work. The following comments focus on some issues that seem likely to directly or indirectly affect learners and the capacity of postsecondary organizations to serve them. The problems are divided into three issue areas: equity, quality, and technology.

### Equity Issues

- **Limited educational services are available for citizens with low levels of prior educational attainment.**

Even though many of the surveyed programs make special efforts to serve individuals with low levels of prior education, it is apparent that, with some notable exceptions, electronic media are serving primarily individuals who are predisposed to pursue further education because of their previous educational experiences. The adults who research shows are most likely to participate in institution-based educational programs resemble very closely the profile of learners served by most of the surveyed programs. They are "white high school graduates, between 25 and 34 years of age, employed more than 35 hours per week, with annual family incomes of $15,000 to $25,000. Female participants are slightly more numerous.[1]"

The fact that this circumstance is shared by most institution-based programs serving adult learners can be of little comfort to educators who employ telecommunications technologies since most electronic media are not limited to serving students on campus or at designated outreach centers. With currently available communications technologies, educators have the capacity to reach learners in their homes, workplaces, and communities in ways that enhance convenience and reduce discomfort for learners who are unfamiliar or uncomfortable with formal education.

Most of the surveyed programs do, in fact, reach some learners who would not otherwise find their way to a traditional college classroom. However, taken as a whole, the clientele data revealed by this survey indicate the postsecondary education community is not fully exploiting the capacities of electronic media to change existing patterns of adult participation in education. Since graduate and professional continuing education programs, by definition, serve those who have achieved higher levels of education, responsibility for using communications technologies to extend educational opportunities probably falls more heavily on the staffs of undergraduate and adult education programs.

Unfortunately, there have been few incentives and many disincentives for educators to serve adults with basic skills deficiencies. Among the deterrents are: state funding formulas that recognize only college credit instruction, state policies that limit instruction for basic skills and GED preparation to secondary school systems, the labor intensive nature of such skill training, and a lack of information about successful approaches to using electronic media to serve such clientele.

Electronic media may not be of much assistance in overcoming these organizational obstacles to solving the problem, but computers, with their infinite patience, are particularly well suited as vehicles for such skill training. Hopefully, as microcomputers become increasingly available, more postsecondary organizations and public school systems will use them to help adults bridge the chasm that separates them from participating in higher education.[2]

One way to use electronic media to overcome the psychological (e.g., fear of formal classroom education) as well as the cognitive barriers to further education is to deliver basic skill training programs into the homes of potential learners via broadcast or cable television. Although learning in their home environments may present problems for these adults, some of the surveyed organizations have had considerable success using television to serve this clientele.[3]

Since a disproportionate number of those benefiting from educational applications of telecommunications technologies already are predisposed to education, it is possible to make the case that many would seek alternative institutional options if the media programming were unavailable. If this pattern persists, it is likely to raise public policy issues regarding the expenses associated with some of the higher cost technologies. It is relatively easy and financially rewarding to serve highly motivated, affluent adults such as engineers and business executives. The challenge for the postsecondary education community is to balance this kind of service with programs designed to reach new learners in their homes, workplaces, and communities.

- **Limited educational services are available for special populations.**

A related issue concerns the current modest level of programming that is specifically designed or adapted to meet the learning needs of special populations such as minority language groups, homebound and handicapped persons, older adults, prisoners, blue and pink collar workers and residents of rural communities. With the exception of rural residents, no one of these populations was served with special programming efforts by any more than 17 percent of the surveyed programs.[4]

Some of these surveyed programs have been designed to serve a specific population such as older adults or blue collar workers. The vast majority, however, serve a general population and, therefore, must modify their regular programming if they are to adjust it to needs of homebound or handicapped students, for example. Adding captioning for the deaf or special audiotape materials for the print handicapped to programming aimed at a general audience requires additional time, energy, and funds that may be in short supply.

Unless the needs of these special learners are considered in the design of educational programming, we may find these groups doubly disadvantaged as educators increasingly turn to electronic media to deliver educational services. Increasingly postsecondary educators will be faced with selecting among technologies with a capacity to reach narrowly defined segments of the population (e.g., narrowcast cable television channels) and the more familiar technologies such as open broadcast television that reach large undifferentiated audiences. The outcome of such choices may either greatly enhance or diminish the learning opportunities for special populations in the future.

- **Access to many of the telecommunications technologies used by educators is increasingly tied to the learner's economic status.**

During the fifties, sixties and early seventies, educators who sought to deliver educational services to students off-campus were limited primarily to open-broadcast television and radio and to the telephone. Despite these limited choices, at least the vast majority of the population had easy access to these technologies regardless of their social or economic status. Recent technological developments in the communications industry and the exploding consumer market in electronic media are changing this picture rapidly. It seems likely that in the near future those who can afford home computers, multiple cable television services (e.g., videotex, educational access channels, narrowcast educational channels), video cassette recorders, and videodisc playback machines will have access to a much wider variety of formal and informal educational options than those who cannot afford any, or all, of them.

Correspondingly, as these nonbroadcast technologies become increasingly common in American homes, educators are likely to rely on them more heavily than on the broadcast technologies that cost the learner very little. If educators become more selective in their use of broadcast media, lower income learners will be at a considerable disadvantage in comparison with their more affluent neighbors. Community learning sites adequately equipped with hardware and software could help offset this pattern of inequity to some extent.

As postsecondary educators in the future peruse the menu of electronic media available for educational purposes, they will need to consider the cost to the learners as well as to the institution. If learners need to subscribe to cable television or purchase a personal computer or videodisc player, many of the costs of education traditionally borne by the college or university will be shifted to the learner. We could be in danger of having not only a society of information "haves" and "have nots," but also of education "haves" and "have nots."

## Quality Issues

Most educators regard educational applications of telecommunications technologies as unconventional and question their academic quality. Despite the fact that traditional approaches are rarely subjected to similar scrutiny and despite the lack of agreement on definitions of what constitutes quality instruction, it is important for educators involved in the use of these technologies to continue to search for ways to improve the quality of their programming. Some issues likely to affect the current and future quality of programming in the postsecondary/telecommunications field are described below:

### • Curriculum Development

Perhaps the most pressing issue that relates to the quality of telecommunications programming is the need to develop educational software capable of more fully utilizing the capacity of the computer. Even without fully considering the educational implications of anticipated advances in computer hardware capabilities, it is clear that educators need to learn much more about how to develop computer software and accompanying print materials that constitute complete courses. Some progress has been made in basic skills, foreign languages, and computer programming toward developing entire courses for the computer; uncoordinated segments that do not constitute complete courses are more typical of current practice in postsecondary education.

More maintstream faculty need to get involved in ongoing efforts to solve this problem. In addition to becoming computer literate, faculty need specialized training that prepares them to apply their content expertise to the task of developing high quality computer courseware. Institutions need to experiment more actively with alternative ways of combining the academic skills of faculty with the technical skills of computer experts. Without substantial progress in the curriculum development area, in the future educators are unlikely to be satisfied with the academic quality of their computer applications. At the same time they may be disappointed to find they are vastly underutilizing the capacity of computer technology.

There is also a need for educators who use audio and video technologies to experiment more aggressively with ways to design institutional materials that are flexible enough to be used effectively by faculty teaching in various instructional settings. Currently, only a small proportion of the nationally marketed audio and video programming is sufficiently flexible in its design and copyright provisions so that faculty can adapt it as they choose. To the extent that the quality of educational experiences depends on the ability of the instructor to match electronic and print media materials to local student needs, there is a critical need for courses that are designed to allow for more flexibility.

There is also a need to develop curricula for programs that combine computer and video technologies. Educators are only in the earliest stages of learning how to integrate these two technologies for instructional purposes. Regardless of whether video cassettes, videodiscs, or some other form of video technology eventually predominate in the commercial marketplace, educators need to experiment with course designs that effectively integrate computers and video.

### • Faculty Involvement/Faculty Resistance

The problem most commonly cited by the staff of the surveyed programs was faculty resistance to the use of telecommunications. If educational applications of electronic media continue to affect more and more aspects of college and university operations, a small cadre of supportive faculty no longer will be sufficient to ensure the academic quality of telecommunications programming. Colleges and universities need to devise strategies that will encourage a larger number of faculty to get involved in using the technologies.

If this field is to benefit from the skills of a substantially larger proportion of the faculty, state and institutional policymakers will need to experiment with rewards and incentives that attract more faculty to it. At a minimum, there is a need to encourage the participation of faculty who are capable of making exceptional contributions in the curriculum development area. However, the fact that a high proportion of faculty who are already tenured have had no formal training in using electronic media for instruction does not make this task easy.

Faculty orientation and training sessions like those offered by many of the surveyed programs can be very effective in encouraging faculty involvement. However, the success of this strategy at least partially depends on the nature of the prevailing rewards and incentives.

- **Learner Access to Library Resources**

One of the reasons many faculty object to using telecommunications technologies is that learners who are remote from the campus often lack ready access to print resource materials necessary to complete assignments in many graduate and undergraduate courses. There are many ways educators can respond to this legitimate concern and, in fact, technological developments are making it easier to obtain access to library resources. In the future, the quality of educational programming for distance learners will depend, in part, on the ability and willingness of educators to address this problem as some of the surveyed programs have begun to do.

## Technology Issues

Until recently the relatively slow pace at which change normally occurs within the academic community had not been much of a problem for educators using electronic media because the telecommunications industry had remained technologically and organizationally rather stable. However, things in this industry have changed. Refinements in existing technologies, development of new technologies, deregulation, and reduced federal funding have contributed to an intensely competitive atmosphere in the telecommunications industry.

Because educators wishing to use electronic media must rely on the products and facilities of the telecommunications industry, changes in that area can have direct and lasting influence on the postsecondary education community. The following technological issues illustrate how options for future use of electronic media by educators can be threatened by developments in the telecommunications industry.

- **ITFS Channels**

As a result of rulings by the Federal Communications Commission (FCC) in 1963 and 1971, 28 channels of Instructional Television Fixed Service (ITFS) were reserved exclusively for nonprofit educational purposes.[5] In some communities educators at all levels have made extensive use of ITFS technology but in others they have made little or no use of ITFS. Among the surveyed programs, ITFS is used to broadcast programming to specific sites in a network and to link colleges and universities to local cable companies. With the rapid expansion of cable television the latter function is becoming increasingly important to educators.

In today's competitive media environment, unused broadcast capacity is such an attractive resource that many for-profit organizations have been pressuring the FCC to make ITFS channels available for commerical use. If educators were to lose access to all or even some of these channels, it would severely constrain the technological options available to them. Although the FCC has taken no definitive action to date, there is a very real possibility that educational interests will lose out to commercial interests. Communities that have made little or no use of ITFS technology seem most vulnerable to such competitive pressures, but even heavy ITFS users such as Stanford University, Emory University, and the Association for Higher Education of North Texas (TAGER) have reason for concern.

- **Educational Access Channels on Cable Television**

Now that the cable franchising process is either well underway or has been completed in most major metropolitan areas, some in the cable industry are lobbying heavily for Congress to pass legislation that would place severe limitations on educational and other public access cable channels. The proposed legislation would require all local governments to change their original cable franchise agreements in ways that would reduce or eliminate opportunities for educational access.

At this stage in the growth of the cable industry, the level of usage by postsecondary educators is still rather modest. As more major metropolitan areas become fully wired for cable, the size of the populations served will undoubtedly stimulate more educational applications. Ironically, it is possible that before the education community reaches such a level of interest and activity, its access to cable television channels may be severely limited by legislation. If educational access is limited or eliminated, educators may have to compete for time on cable channels at commercial rates unless cable operators are willing to contribute it to them.

- **Increases in Telephone Rates**

In the aftermath of the divestiture of the American Telephone and Telegraph Company, the costs of communicating via telephone lines may be escalating substantially. Sharp rises in these rates pose a very real threat to all organizations that depend on phone lines to transmit voice, video, or data communications.

Audio teleconferencing, which has been one of the most cost-efficient technologies for serving groups of learners dispersed over large geographical areas, could conceivably become much less affordable for many postsecondary organizations. At a time when many statewide networks are in developmental or early implementation phases, such cost increases could be very damaging. It seems ironic that just at the time when many educators have come to appreciate the advantages of this low-cost, interactive technology, it may become much less affordable.

- **Radio Reading Services for the Print and Physically Handicapped**

Another indication of the growing competition for access to communication resources is the struggle over who gets to use the FM radio subcarrier (SCA) medium. Currently, more than 50 radio reading services in the United States and Canada use SCA technology to provide reading services to those who are visually or physically handicapped.[6] The FCC is considering proposals that would open up public FM radio subcarriers for commercial use. In response to this effort supporters of the reading services are seeking to reserve a subcarrier of every public FM station for "public telecommunications services."[7] If commercial use of SCA is permitted, financially hard-pressed public FM radio stations may find it difficult to resist opportunities for new revenue even if commercial use does reduce the air-time available for radio reading services.

- **Access to Satellites**

Business and industry are increasingly using communication satellites for teleconferencing and data transmission. Until there is a substantial increase in satellite transponder capacity, opportunities for nonprofit educational organizations are likely to be constrained severely by the effects of competitive market conditions on costs and scheduling. This means that, at least in the near future, there is likely to be less experimentation with educational programming that involves large blocks of satellite time than there might otherwise have been. Individual teleconferences, rather than semester-long courses, are likely to be the norm. Fortunately, postsecondary organizations can turn to the Public Service Satellite Consortium and the National University Teleconference Network for advice and assistance on using satellite technology.

These are just some of the technological issues with the potential to affect the capacity of postsecondary educators to serve learners in the future. The pattern of increasing competition for access to electronic media resources among commercial and nonprofit organizations seems likely to continue and even intensify in the near future.

## Possible Future Developments in Postsecondary Education

Speculating about future devleopments in the postsecondary/telecommunications field is risky. However, for educators who need to make plans for the future of their organizations, it is a necessary activity. One way to begin considering what the not-too-distant future holds is to review those current patterns and trends that seem most likely to persist for some time. The following is a brief review of some of the patterns and trends discussed in previous chapters.

### Summary Of Patterns And Trends

- The number of postsecondary organizations using electronic media to serve students continues to expand.
- Postsecondary organizations continue to combine two or more technologies in order to shape educational delivery systems to local needs.
- Educational programs continue to integrate interactive technologies such as audio teleconferencing and personal computers into delivery systems that previously relied primarily on noninteractive technology.
- Educational programs continue to use open-broadcast technologies but on a more selective basis than in the past; use of nonbroadcast technologies like cable television and audio and video cassettes continues to expand.
- The trend toward greater formal and informal cooperation among postsecondary organizations and between them and business and industry continues to characterize the postsecondary/telecommunication field.
- Some postsecondary organizations that use electronic media continue to experiment with ways to design instructional materials that are sufficiently flexible to be used for multiple purposes by many different organizations.
- Audio, video, and computer courseware continues to be developed for national distribution by both nonprofit and for-profit educational organizations; the for-profit organizations' share of this market continues to expand.
- Colleges and universities that use electronic media continue to develop audio, video, and computer courseware for their own local use; the level of such activity is likely to increase as technologies such as cable television and personal computers become more pervasive.
- Faculty resistance to curricular materials not produced or adapted by the faculty and staff of the local institution continues to be a major problem for programs that use electronic media.
- The staffs of some educational programs employing communications technologies continue to experiment with ways to incorporate experiential learning (e.g., take-home lab kits, field trips) into courses taught to distance learners.
- Many program staffs continue to experiment with ways to decentralize student support services (e.g., counseling, library resources) that have traditionally been available on campus.
- The trend toward using telecommunications technologies to individualize instruction and support services for distance learners continues.
- The trend toward combining the strengths of correspondence education and delivery by electronic media continues.
- A large proportion of the students taking instruction that employs telecommunications technologies continue to be enrolled concurrently in on-campus and off-campus courses.

### Anticipated Technological Developments

If these trends continue, and if some of the anticipated technological developments do materialize, it will be easier to speculate about the effects electronic media are likely to have on postsecondary education. Some of the technological developments that seem likely to occur in the near future include:

- Personal computers will be readily available to citizens in their homes, schools, colleges, and community organizations.
- Personal computers will be less expensive, smaller, and more portable.
- Electronic alternatives to the delivery of print information (e.g., teletext, videotex, electronic mail) will be readily available in the home.
- Methods of interfacing microcomputers with other technologies such as video cassettes, videodiscs, videotex, and interactive cable television will be readily available.
- Cable television penetration will expand to include over 40 percent of the American

television viewing audience

- Narrowcasting of video programming to special audiences will be more common.
- Computerized library catalogs and electronic print (e.g., videodisc, videotex) versions of library materials will be available in the home.
- Commerical computerized data banks will be available in the home.
- Computer conferencing, electronic mail, and audio teleconferencing will be commonly used for communication among individuals, and groups.
- There will be much more extensive transmission of programming by satellite; direct satellite-to-home broadcasting will be one form of this activity.

**Future Impacts On Postsecondary Education**

Some of the ways in which the future of postsecondary education is likely to be affected by these various trends include the following:

- Most learners are likely to have access to such extensive educational resources in their homes and local communities (e.g., public library, community center) that they will have less need to come to a college campus.
- It will be increasingly possible for colleges and universities to decentralize educational services that have traditionally been available on the campus; colleges and universities serving learners that are dispersed over large geographical areas are most likely to take advantage of these options in the face of rising energy costs and funding constraints.
- Electronic links between universities and industries are likely to be much more common.
- Distinctions between on-campus and off-campus students are likely to become increasingly blurred as more educational resources are available in the home and community.
- Instruction by independent study is likely to become an increasingly attractive option for learners and educators alike.
- Compared with current practice, educators should be able to serve both much larger and much smaller groups of learners cost effectively by using various combinations of electronic and print media.
- Most students will bring their own microcomputers to college with them.
- Many colleges and universities will have their own local computer network into which students can plug their microcomputers.
- Competition from the for-profit sector is likely to make substantial inroads into what has traditionally been postsecondary education's domain; professional and adult continuing education, vocational and technical education, and basic skills instruction are most likely to be affected.
- Collaborative arrangements among colleges and universities are likely to be based on shared academic concerns with much less regard for geographical proximity than is currently the case (e.g., exchanges of courses via satellite, cooperative development and distribution of courseware, participation in state and national networks).
- The technological applications that are most likely to persist are those that pose the least threat to the traditional role of the faculty (e.g., audio teleconferencing).
- State and traditional institutional boundaries are likely to be penetrated often by instructional programming originating from different parts of the country; much of this activity is likely to be in cooperation with the local institutions, but, especially in the case of professional continuing education, it is likely to be more competitive rather than cooperative.
- Most colleges and universities are likely to integrate their voice, video, and data communications into a single system that combines administrative, instructional, and research functions.
- Assessing for college credit learning that has occurred in the home, workplace, or community is likely to become a much larger part of the role played by colleges and universities in our society.
- The availability of alternative sources for most information could free colleges and universities to focus more attention on developing student competencies and less on transferring information.

This list hardly exhausts the range of potential impacts the telecommunications field is likely to have on postsecondary education. However, it does suggest that many of the potential problems and possibilities are significant enough to warrant serious consideration by the postsecondary educational community.

### Some Challenges Facing Postsecondary Education

These are only some of the many problems and possibilities associated with the postsecondary telecommunications field. The task of solving such problems and shaping future developments pose numerous challenges for the postsecondary education community. Some of the challenges include the following:

- Expand the level of interinstitutional and education/industry collaboration focused on the cooperative development of educational software for all technologies, but especially, videodiscs and computers.
- Devise ways of using telecommunications technologies to reach individuals with low levels of prior learning and other special learning needs.
- Expand cooperative arrangements with community organizations such as public libraries in order to make educational applications of telecommunications technologies available to those who do not have access to them in their homes.
- Evolve educational delivery systems that strike a balance between the technologies' capacity to individualize instruction and the learner's need for social interaction with faculty and peers.
- Experiment with educational delivery systems that incorporate the advantages of the technologies, but do so at a low level of cost to both the student and the postsecondary organization.
- Evolve organizational patterns that respond to the capacity of the technologies to alter traditional institutional arrangements (e.g., decentralization of traditional on-campus services, integration of telecommunications technology applications into all the academic departments of an institution).
- Develop state and institutional policies that encourage a broader cross-section of faculty to apply their expertise to the problems of developing and delivering instructional materials that use telecommunications technologies.

Hopefully, postsecondary educators will be able to adequately respond to such challenges in the near future. Regardless of what happens in the education community, it is apparent that these new technological developments will continue to alter the nature of American society. Colleges and universities will have to contend with expanding competition from private industry and more students who have ready access to sophisticated technology and vast amounts of information. We can only hope that the education community can keep pace with the accelerating rate at which telecommunications technologies are changing our society.

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[1] K. Patricia Cross, "Adult Learners: Characteristics, Needs and Interests." in Richard Peterson (ed.) *Lifelong Learning in America.* San Francisco: Jossey Bass Publishers, 1979, p. 80.

[2] The City of Baltimore, St. Augustine's College, and the University of Illinois (PLATO Corrections Project) are three of the surveyed programs that use computers to address this problem.

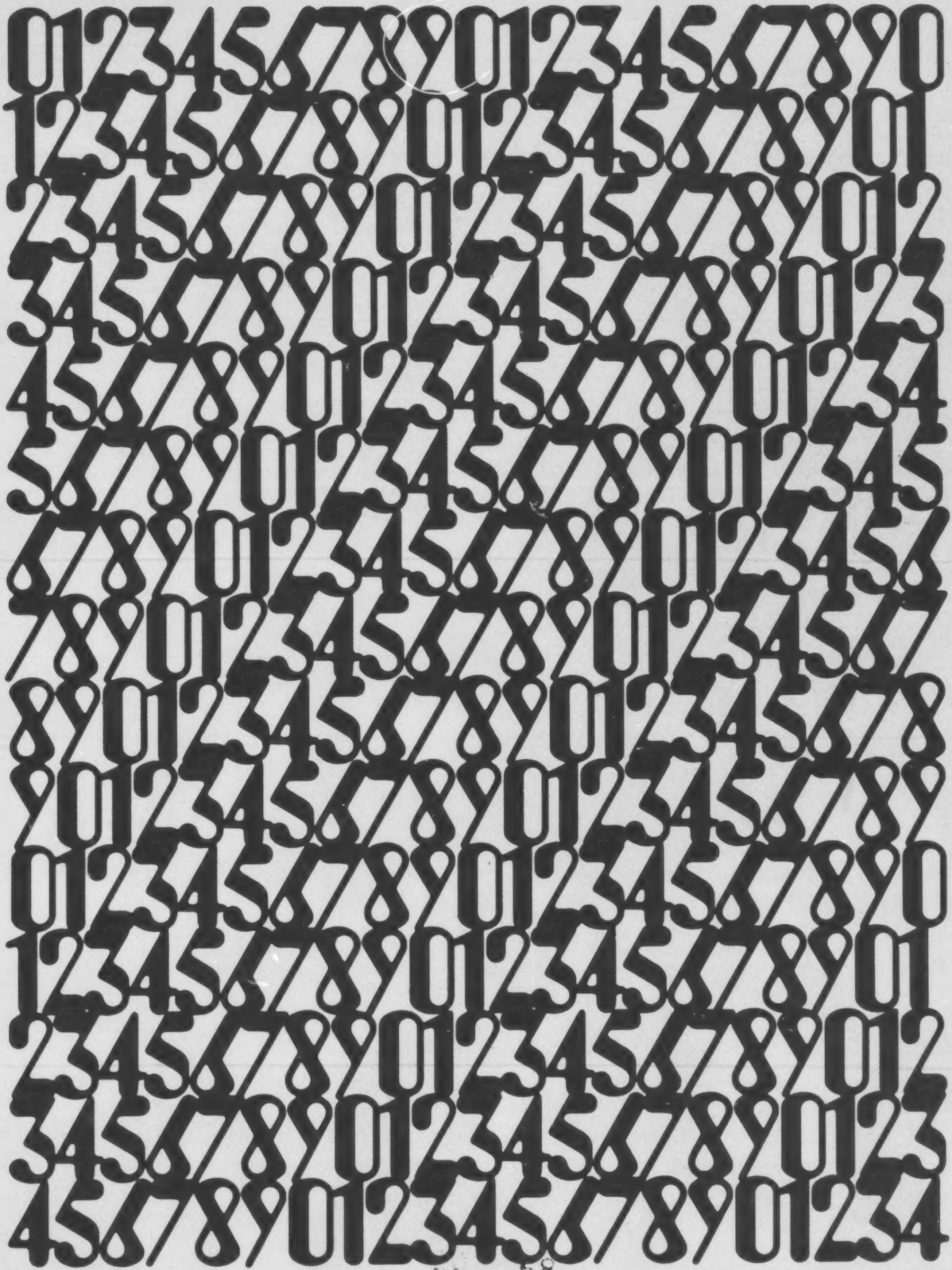
[3] Two examples of such organizations are City-Wide College of Chicago and the Wisconsin Vocational, Technical and Adult Education System.

[4] In spite of this, seventy-one percent of the surveyed programs did make special programmatic provisions for at least one of these special populations but, in most cases, for no more than one.

[5] John A. Curtis, "Instructional Television Fixed Service: A Most Valuable Educational Resource." in John A. Curtis and Joseph M. Biedenbach (eds.) *Educational Telecommunications Delivery Systems.* Washington, D.C.: American Society for Engineering Education, 1979, p. 29.

[6] Stanley C. Potter, "Radio Reading Service: The Minnesota Experience." in John A. Curtis and Joseph M. Biedenbach (eds.), *Educational Telecommunications Delivery Systems.* Washington, D.C.; American Society for Engineering Education, 1979, p. 103.

[7] "NPR Board Report," *CURRENT,* Vol. 1, No. 3, 1982, p. 5.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# 3

# DIRECTORY OF PROGRAMS

Each of the following 70 program descriptions is based on information obtained from a combination of existing print materials and an extensive interview of one or more staff members. Each program description was written by the author or a consultant to the Center for Learning and Telecommunications and subsequently sent (in a draft form) to the designated contact person (or his/her representative) who reviewed it for accuracy.

# EDUCATIONAL MISSION

| | | | | | | | | | Special Populations | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Lower Division Undergraduate | Upper Division Undergraduate | Vocational/Technical | Graduate | Professional Continuing Educ. | Adult Continuing Education | Public Service Programs | Information, Counselling | Older Adult | Handicapped | Incarcerated | Workers | Rural | Spanish Speakers | ABE/GED | Page Number |
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| City-Wide College (Chicago) | ● | | ● | | | ● | ● | ● | | ● | ● | | | ● | ● | 110 |
| Coastline Community College | ● | | | | | ● | | | | ● | ● | | | | | 112 |
| College of San Mateo | ● | | ● | | ● | | | | | | | ● | | | | 117 |
| Columbus Technical Institute | ● | | ● | | | ● | | | | | | | | | | 121 |
| Dallas County Community College District | ● | | | | | ● | | | | | | | | | | 125 |
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| Los Angeles Community College District | ● | | | | | ● | | | | | | | | | | 145 |
| Miami-Dade Community College | ● | | | | | ● | | | | ● | ● | | | ● | | 151 |
| Milwaukee Area Technical College | ● | | ● | | | ● | | | | | ● | | | | | 156 |
| Northern Virginia Community College | ● | | ● | | | ● | | | | | ● | | | | | 165 |
| Queensborough Community College | ● | | | | | | | | | ● | | | | | | 174 |
| Rio Salado Community College | ● | | ● | | | ● | ● | ● | | ● | ● | ● | ● | | | 178 |
| Tacoma Community College | ● | | | | | ● | | | | ● | ● | | | | | 190 |
| **FOUR-YEAR COLLEGES AND UNIVERSITIES** | | | | | | | | | | | | | | | | |
| California State University, Chico | | ● | | | | ● | | ● | | | | | ● | | | 101 |
| Central Missouri State University | ● | ● | | | | ● | ● | | | | | | | | ● | 105 |
| College of Great Falls | | | | | | ● | | | | | | ● | ● | | | 115 |
| Colorado State University | | | | ● | ● | | | | | | | | | ● | | 119 |
| Eastern Oregon State College | ● | ● | | | ● | ● | | | | | | | ● | | | 130 |
| Emory University School of Medicine | | | | | ● | | | | | | | | | | | 133 |
| Michigan State University (Rockford Project) | | | | | ● | | | | | | | ● | | | | 154 |
| New York University | ● | ● | | | | ● | | | | | | | | | | 161 |
| North Carolina State University, School of Textiles | ● | ● | | ● | ● | | | | | | | ● | | | | 163 |
| Pennsylvania State University | ● | ● | | ● | ● | ● | ● | ● | | ● | | ● | ● | | | 167 |
| San Diego State University | | | | | | ● | ● | | ● | | | | | | | 184 |
| St. Augustine's College | | | | | | ● | | ● | | | | | | | ● | 180 |
| Stanford University | | | | ● | ● | | | | | | | | | | | 188 |
| Trinity University | | | | ● | ● | | | | | | | | | | | 195 |
| University of Illinois (Plato Project) | | | | | | | | | | | ● | | | | ● | 197 |
| University of Illinois (Electronic Blackboard) | | ● | | ● | ● | | | | | | | | | | | 199 |
| University of Maryland | ● | ● | | | ● | ● | | | | | | | | | | 201 |
| University of Minnesota | ● | ● | | ● | ● | ● | ● | | | | | | ● | | | 208 |
| University of Nebraska | ● | ● | | ● | ● | ● | | | | | | | ● | | | 211 |
| University of Nevada | ● | ● | | ● | ● | ● | ● | | | | | | ● | | | 213 |
| University of South Carolina/S.C. ETV Commission | ● | ● | | ● | ● | ● | ● | | | | | | ● | | | 215 |
| University of South Florida | ● | ● | | | | ● | | | ● | | | | | | | 218 |
| University of Texas Health Science Center at San Antonio | ● | ● | | | ● | ● | ● | | ● | | | | ● | | | 220 |
| University of Washington | ● | ● | | ● | ● | ● | | | | | | | ● | | | 223 |
| University of Wisconsin | | ● | | ● | ● | ● | ● | | | | | | ● | | | 226 |
| Wayne State University | ● | ● | | | | | | | | | | ● | | | | 229 |
| West Virginia College of Graduate Studies | | | | ● | ● | ● | | | | | | | ● | | | 232 |
| West Virginia Wesleyan College | ● | ● | | | | | | | | | | | ● | | | 234 |

Note: Entries in this chart only refer to the program(s) listed in the table of contents, not the entire institution or organization.

# EDUCATIONAL MISSION

| | | | | | | | | | Special Populations | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Lower Division Undergraduate | Upper Division Undergraduate | Vocational/Technical | Graduate | Professional Continuing Educ. | Adult Continuing Education | Public Service Programs | Information, Counselling | Older Adult | Handicapped | Incarcerated | Workers | Rural | Spanish Speakers | ABE/GED | Page Number |
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| Bay Area Community College Television Consortium | ● | | | | | ● | | | | | | | | | | 95 |
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| Kentucky Council on Higher Education | ● | ● | | ● | ● | ● | | | | | | | ● | | | 140 |
| San Diego and Imperial Counties Community College Association | ● | ● | | ● | | ● | | | | | | | | | | 182 |
| Southern California Consortium for Community College Television | ● | | ● | | | ● | ● | | ● | ● | ● | ● | | ● | | 186 |
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| WYES/Twelve, New Orleans | | | | | | | | ● | | | | | | ● | | 242 |
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| Wisconsin Vocational, Technical and Adult Education System | ● | | ● | | | ● | | | | | | | ● | | ● | 236 |
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| Appalachian Community Service Network (ACSN) | ● | ● | | ● | ● | ● | ● | | | | | | ● | | | 83 |
| Association for Continuing Education (ACE) | | ● | | ● | ● | ● | | | | | | ● | | | | 86 |
| Rand Corporation and Telecable of Spartanburg | | | | | | ● | | | ● | | | | | | ● | 176 |
| Medical Care Development, Inc. | | | | | ● | ● | ● | | | | | | ● | | | 149 |

Note: Entries in this chart only refer to the program(s) listed in the table of contents, not the entire institution or organization.

# TELECOMMUNICATIONS TECHNOLOGIES I

| ORGANIZATIONS | Open Broadcast Television | Microwave (ITFS) | Microwave (point-to-point) | Cable Television (one-way) | Cable Television (interactive) | Slow-Scan/Freeze-Frame Television | Satellite | Video Teleconferencing | Electronic Blackboard* | Page Number |
|---|---|---|---|---|---|---|---|---|---|---|
| | VIDEO | | | | | | | | | |
| **TWO-YEAR COLLEGES** | | | | | | | | | | |
| Central Piedmont Community College | ● | | | ● | | | | | | 107 |
| City-Wide College (Chicago) | ● | | | | | | | | | 110 |
| Coastline Community College | ● | | | | | | | | | 112 |
| College of San Mateo | | | | | | | | | | 117 |
| Columbus Technical Institute | | | | | ● | | | | | 121 |
| Dallas County Community College District | ● | | | ● | | | | | | 125 |
| Kirkwood Community College | | ● | ● | ● | | | | ● | | 142 |
| Los Angeles Community College District | ● | | | | | | | | | 145 |
| Miami-Dade Community College | ● | ● | | ● | | | | | | 151 |
| Milwaukee Area Technical College | ● | | | ● | | | | | | 156 |
| Northern Virginia Community College | ● | | | | | | | | | 165 |
| Queensborough Community College | | | | | | | | | | 174 |
| Rio Salado Community College | ● | | | ● | | ● | | | | 178 |
| Tacoma Community College | ● | | | ● | | | | | | 190 |
| **FOUR-YEAR COLLEGES AND UNIVERSITIES** | | | | | | | | | | |
| California State University, Chico | | ● | | ● | | | | | | 101 |
| Central Missouri State University | | | | | | | | | | 105 |
| College of Great Falls | | | | | | | | | | 115 |
| Colorado State University | | | | | | | | | | 119 |
| Eastern Oregon State College | ● | | | | | | | | | 130 |
| Emory University School of Medicine | | ● | | | | | | | | 133 |
| Michigan State University (Rockford Project) | | | | | ● | | | | | 154 |
| New York University | ● | | | | | | | | | 161 |
| North Carolina State University, School of Textiles | | | | | | | | | | 163 |
| Pennsylvania State University | ● | | | ● | | | ● | ● | | 167 |
| San Diego State University | ● | | | ● | | | | | | 184 |
| St. Augustine's College | | | | | | | | | | 180 |
| Stanford University | | ● | | | | | | | | 188 |
| Trinity University | | | | | | | | | | 195 |
| University of Illinois (Plato Project) | | | | | | | | | | 197 |
| University of Illinois (Electronic Blackboard) | | | | | | | | ● | ● | 199 |
| University of Maryland | ● | | | | | | | | | 201 |
| University of Minnesota | ● | | | ● | | | | | | 208 |
| University of Nebraska | ● | | | ● | | | | | | 211 |
| University of Nevada | | | | | | | | | | 213 |
| University of South Carolina/S.C. ETV Commission | ● | | ● | ● | | | | ● | | 215 |
| University of South Florida | ● | | | | | | | | | 218 |
| University of Texas Health Science Center at San Antonio | | | | ● | | | | | | 220 |
| University of Washington | | | | ● | | | | | | 223 |
| University of Wisconsin | | | | | | ● | | | | 226 |
| Wayne State University | ● | ● | | ● | | | | | | 229 |
| West Virginia College of Graduate Studies | ● | | | ● | | | | | | 232 |
| West Virginia Wesleyan College | | | | | | | | | | 234 |

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* Electronic blackboard, a telephone-based technology, is included here because what the student sees is graphic information on a television monitor.

# TELECOMMUNICATIONS TECHNOLOGIES I

| | VIDEO | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Open Broadcast Television | Microwave (ITFS) | Microwave (point-to-point) | Cable Television (one-way) | Cable Television (interactive) | Slow-Scan/Freeze-Frame Television | Satellite | Video Teleconferencing | Electronic Blackboard* | Page Number |
| **CONSORTIA (LOCAL AND STATE)** | | | | | | | | | | |
| Association for Higher Education of North Texas (TAGER) | | ● | ● | ● | | | ● | ● | | 88 |
| Bay Area Community College Television Consortium | ● | ● | | ● | | | | | | 95 |
| Cable Advisory Board for Learning and Education (CABLE) | | | | ● | | | | | | 99 |
| Indiana Higher Education Telecommunication System (IHETS) | | ● | ● | ● | | | | | | 135 |
| Kansas Regents Continuing Education Network (TELENET) | | | | | | | | | | 138 |
| Kentucky Council on Higher Education | ● | | | ● | | | | ● | | 140 |
| San Diego and Imperial Counties Community College Association | ● | ● | | ● | | | | | | 182 |
| Southern California Consortium for Community College Television | ● | ● | | ● | | | | | | 186 |
| **CONSORTIA (REGIONAL AND NATIONAL)** | | | | | | | | | | |
| Association for Media Based Continuing Education for Engineers (AMCEE) | | | | | | | | | | 91 |
| Community College of Philadelphia (Community College at Home Project) | ● | | | ● | | | | | | 123 |
| Eastern Educational Consortium | ● | | | ● | | | | | | 128 |
| National University Consortium (NUC) | ● | | | ● | | | ● | | | 158 |
| To Educate the People Consortium (TEP) | ● | ● | | ● | | | ● | ● | | 192 |
| University of Mid-America (UMA) | ● | | | ● | | | | | | 204 |
| **BROADCAST FACILITIES** | | | | | | | | | | |
| Catholic Television Network, Bay Area Dioceses | | ● | | | | | | ● | | 103 |
| Maryland Center for Public Broadcasting | ● | | | ● | | | | | | 147 |
| Public Broadcasting Service (PBS) | ● | | | ● | | | ● | ● | | 170 |
| WNET/Thirteen, New York | ● | | | | | | | | | 239 |
| WYES/Twelve, New Orleans | ● | | | | | | | | | 242 |
| **COMMUNITY-BASED ORGANIZATION** | | | | | | | | | | |
| Berks Community Television | | | | | ● | | | ● | | 97 |
| **GOVERNMENT AGENCIES** | | | | | | | | | | |
| Baltimore Mayor's Office of Manpower Resources | | | | | | | | | | 93 |
| Wisconsin Vocational, Technical and Adult Education System | ● | | | ● | | | | | | 237 |
| **PROFESSIONAL ASSOCIATIONS** | | | | | | | | | | |
| American Bar Association (ABA) | | | | | | | | ● | | 79 |
| American Dietetic Association (ADA) | | ● | | ● | | | ● | ● | | 87 |
| **NON-PROFIT ORGANIZATIONS** | | | | | | | | | | |
| Appalachian Community Service Network (ACSN) | | | | ● | | | ● | ● | | 83 |
| Association for Continuing Education (ACE) | | ● | | | | | | ● | | 87 |
| Rand Corporation and Telecable of Spartanburg | | | | | ● | | | ● | | 176 |
| Medical Care Development, Inc. | | | ● | | | ● | | ● | | 149 |

Note: Entries in this chart only refer to the program(s) listed in the table of contents, not the entire institution or organization.

* Electronic blackboard, a telephone-based technology, is included here because what the student sees is graphic information on a television monitor.

# TELECOMMUNICATIONS TECHNOLOGIES II

| | AUDIO | | | | | COPY | | COMPUTER | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **ORGANIZATIONS** | Radio (primary carrier) | Radio (subcarrier-SCA) | Telephone | Audio Teleconferencing | Telephone-Accessed Audiotape | Videotape | Audiotape | Computer-Assisted Instruction (CAI) | Computer-Based Instructional Management (CBIM) | Computer/videotape Interface | Computer/cable Interface | Page Number |
| **TWO-YEAR COLLEGES** | | | | | | | | | | | | |
| Central Piedmont Community College | | ● | ● | | ● | ● | ● | | | | | 107 |
| City-Wide College (Chicago) | ● | | ● | | | ● | ● | | | | | 110 |
| Coastline Community College | ● | | ● | | | ● | ● | | ● | | | 112 |
| College of San Mateo | | | ● | | | ● | | ● | | ● | | 117 |
| Columbus Technical Institute | | | ● | | | ● | | | | | ● | 121 |
| Dallas County Community College District | ● | | ● | | | ● | ● | | | | | 125 |
| Kirkwood Community College | ● | | ● | | | ● | ● | | | | | 142 |
| Los Angeles Community College District | | | ● | | | ● | | | | | | 145 |
| Miami-Dade Community College | ● | | ● | | | ● | ● | | ● | | | 151 |
| Milwaukee Area Technical College | ● | | ● | | | ● | ● | | | | | 156 |
| Northern Virginia Community College | ● | | ● | | | ● | ● | | | | | 165 |
| Queensborough Community College | | | ● | ● | | | | ● | | | | 174 |
| Rio Salado Community College | ● | ● | ● | ● | | ● | ● | | ● | | | 178 |
| Tacoma Community College | ● | | ● | | ● | ● | ● | | | | | 190 |
| **FOUR-YEAR COLLEGES AND UNIVERSITIES** | | | | | | | | | | | | |
| California State University, Chico | | | ● | | | | | | | | | 101 |
| Central Missouri State University | ● | | ● | | | | ● | | | | | 105 |
| College of Great Falls | | | ● | ● | | ● | ● | | | | | 115 |
| Colorado State University | | | ● | | | ● | | | | | | 119 |
| Eastern Oregon State College | | | ● | ● | | ● | ● | ● | | | | 130 |
| Emory University School of Medicine | | | ● | | | ● | | | | | | 133 |
| Michigan State University (Rockford Project) | | | | | | ● | | ● | | ● | ● | 154 |
| New York University | | | ● | | | | | | | | | 161 |
| North Carolina State University, School of Textiles | | | ● | | | ● | | | | | | 163 |
| Pennsylvania State University | | | ● | ● | | ● | ● | | ● | | | 167 |
| San Diego State University | | | ● | | | | | | | | | 184 |
| St. Augustine's College | | | | | | | | ● | | | | 180 |
| Stanford University | | | ● | | | ● | | | | | | 188 |
| Trinity University | | | ● | ● | | | | | | | | 195 |
| University of Illinois (Plato Project) | | | | | | | | ● | | | | 197 |
| University of Illinois (Electronic Blackboard) | | | ● | ● | | ● | | | | | | 199 |
| University of Maryland | | | ● | | | ● | ● | | | | | 201 |
| University of Minnesota | ● | | ● | | | ● | ● | | | | | 208 |
| University of Nebraska | | | ● | ● | | ● | ● | | | | | 211 |
| University of Nevada | | | ● | ● | | | | | | | | 213 |
| University of South Carolina/S.C. ETV Commission | ● | | ● | | | ● | ● | | | | | 215 |
| University of South Florida | ● | | ● | | | ● | ● | | | | | 218 |
| University of Texas Health Science Center at San Antonio | | | ● | ● | | ● | ● | | | | | 220 |
| University of Washington | | | ● | ● | | | | | | | | 223 |
| University of Wisconsin | | | ● | ● | | ● | ● | | | | | 226 |
| Wayne State University | | | ● | | | ● | ● | | | | | 229 |
| West Virginia College of Graduate Studies | | | ● | ● | | | ● | | | | | 232 |
| West Virginia Wesleyan College | | | ● | | | | ● | | | | | 234 |

**Note:** Entries in this chart only refer to the program(s) listed in the table of contents, not the entire institution or organization.

# TELECOMMUNICATIONS TECHNOLOGIES II

| | AUDIO | | | | | COPY | | COMPUTER | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Radio (primary carrier) | Radio (subcarrier-SCA) | Telephone | Audio Teleconferencing | Telephone-Accessed Audiotape | Videotape | Audiotape | Computer-Assisted Instruction (CAI) | Computer-Based Instructional Management (CBIM) | Computer/videotape interface | Computer/cable interface | Page Number |
| **ORGANIZATIONS** | | | | | | | | | | | | |
| **CONSORTIA (LOCAL AND STATE)** | | | | | | | | | | | | |
| Association for Higher Education of North Texas (TAGER) | | | • | | | • | | | | | | 88 |
| Bay Area Community College Television Consortium | • | | • | | | • | • | | | | | 95 |
| Cable Advisory Board for Learning and Education (CABLE) | | | • | | | • | | | | | | 99 |
| Indiana Higher Education Telecommunication System (IHETS) | | | • | • | | • | | | | • | | 135 |
| Kansas Regents Continuing Education Network (TELENET) | | | • | • | | • | | | | | | 138 |
| Kentucky Council on Higher Education | | | • | | | • | | | | | | 140 |
| San Diego and Imperial Counties Community College Association | | | • | | | • | | | | | | 182 |
| Southern California Consortium for Community College Television | • | | • | | | • | • | | | | | 186 |
| **CONSORTIA (REGIONAL AND NATIONAL)** | | | | | | | | | | | | |
| Association for Media Based Continuing Education for Engineers (AMCEE) | | | | | | • | | | | | | 91 |
| Community College of Philadelphia (Community College at Home Project) | | | • | | | • | | | | | | 123 |
| Eastern Educational Consortium | | | • | | | • | | | | | | 128 |
| National University Consortium (NUC) | | | • | | | • | | | | | | 158 |
| To Educate the People Consortium (TEP) | | | • | | | • | | | | | | 192 |
| University of Mid-America (UMA) | | | • | | | • | • | | | | | 204 |
| **BROADCAST FACILITIES** | | | | | | | | | | | | |
| Catholic Television Network, Bay Area Dioceses | | | • | | | • | | | | | | 103 |
| Maryland Center for Public Broadcasting | | | • | | | • | | | | | | 147 |
| Public Broadcasting Service (PBS) | • | | • | | | • | • | | | | | 170 |
| WNET/Thirteen, New York | | | • | | | • | | | | | | 239 |
| WYES/Twelve, New Orleans | | | • | | | • | | | | | | 242 |
| **COUNTY-BASED ORGANIZATION** | | | | | | | | | | | | |
| Berks Community Television | | | • | | | • | | | | | | 97 |
| **GOVERNMENT AGENCIES** | | | | | | | | | | | | |
| Baltimore Mayor's Office of Manpower Resources | | | | | | | | • | | | | 93 |
| Wisconsin Vocational, Technical and Adult Education System | | | • | | | • | | | | | | 237 |
| **PROFESSIONAL ASSOCIATIONS** | | | | | | | | | | | | |
| American Bar Association (ABA) | | | • | | | • | • | | | | | 79 |
| American Dietetic Association (ADA) | | | • | | | • | | | | | | 81 |
| **NON-PROFIT ORGANIZATIONS** | | | | | | | | | | | | |
| Appalachian Community Service Network (ACSN) | | | • | | | • | | | | | | 83 |
| Association for Continuing Education (ACE) | | | • | | | • | | | | | | 87 |
| Rand Corporation and Telecable of Spartanburg | | | • | | | | | | | | • | 176 |
| Medical Care Development, Inc. | | | • | | | | | | | | | 149 |

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# AMERICAN BAR ASSOCIATION (ABA)

**Telecommunications Program**
Consortium for Professional Education

## Educational Mission

The consortium produces and distributes nationwide continuing legal education materials to several discrete markets. Customers include: law firms (29 percent), corporation law departments (27 percent), universities (20 percent), state and local Bar associations and continuing legal education associations (14 percent) and governmental agencies (9 percent). Although no information is available about the characteristics of individuals using the materials, most of those served are lawyers and others actively employed in the legal profession.

## Telecommunications Technologies

The primary technology used by the consortium is videotape. In addition, in 1981 it sponsored an experimental, one-time series of continuing legal education seminars that featured two-way video-audio interaction between faculty and participants. These seminars, entitled "Interactive Videolaw Seminars," have been teleconferenced to several major cities and make use of voice-activated cameras, an electronic blackboard, a graphics station with an overhead camera, a hard-copy graphics generator, and a telephone audio hookup. Bell Telephone special picturephone meeting rooms in those cities have been used by program participants.

## Curriculum

The current consortium library includes a total of 242 videotapes (representing 160 hours of programming). Included among the tapes are 162 individual programs for 26 major instructional productions, which range in length from 20 minutes to 12 hours. Topics include appellate advocacy, antitrust counseling, basic concepts in evidence, legal ethics, trial techniques, and use of computers in complex litigation. The consortium concentrates on developing programs that are not dominated by local legal issues, on skill development programs (e.g., trial techniques), and on programs designed to improve the effectiveness of the operation of the legal profession (e.g., management techniques). Little use is made of the programs for credit, except in the case of some law schools where the materials are used to supplement regular credit course materials. All but one production were recorded by the consortium and about five new productions are developed each year. Comprehensive print materials (10 to 600 pages long) are distributed along with the videotapes. They include transcripts of vignettes (shown on the tapes); related articles, case documents, and facts; character sketches; faculty biographies; and bibliographies. All programs are previewed live before being recorded live or in a studio.

## Faculty Roles

The director and associate and assistant directors spend considerable time traveling throughout the country reviewing current ongoing courses. They select instructors who can be effective on television as well as topics for inclusion as Videolaw Seminars. Once a topic is selected, an expert advisory committee of three to four persons is selected to assist staff and the instructor with text development. These committees usually include both faculty members and practicing attorneys. Consortium staff help the instructor use the program script and studio equipment. Instructors receive no compensation for their instructional activities; the local agency that rents or purchases the tape is responsible for providing support services to individual viewers.

## Delivery System

The consortium distributes the videotapes by mail to the markets described previously (see Educational Mission). Since its inception in 1975-76, the consortium has filled 1,517 orders for 1,048 customers (law firms, governmental agencies, etc.). Over 43 percent of the orders were filled on a rental basis; 57 percent represented purchases.

The first Interactive Videolaw Seminar originated from Chicago and was teleconferenced to New York, Washington, D.C., and Atlanta, with an enrollment limit of 20 registrants per site. The second and third programs included Chicago, New York, Washington, D.C., and San Francisco.

### Noteworthy Features

- sponsors a professional continuing education program that serves the legal profession on a national basis
- makes continuing legal education widely accessible to individuals throughout the country who otherwise may have limited access to such programming
- produces an extensive selection of continuing legal education videotapes
- experimenting with national interactive video teleconferences using Bell Telephone picturephones

### Problems Encountered

- working around the limited availability of videotape players in settings other than schools
- financing the high costs of video teleconferencing

### Observations About Distance Learning

- lack of familiarity with videocassette recorders is one reason people are reluctant to use video cassettes for education
- videotape is a very appropriate vehicle for conveying practical how-to information such as legal continuing education
- users of the videotapes perceive them to be of high quality, according to ABA staff

### Future Plans

- continue production and distribution of videotapes
- explore other uses of video (e.g., cable, satellite), including conversion of videotapes to videodiscs and increased use of teleconferencing

**Contact Persons**

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## Enrollment

Although no accurate enrollment figures are available, consortium staff estimate that approximately 100,000 individuals viewed one or more of the videotape programs in 1981. No information is available on program completion rates.

## Administrative Structure

The consortium is operated by the Division of Professional Education of the ABA and works cooperatively with local and state Bar associations and continuing legal education associations. The six full-time staff members include a director, an associate director (production), two assistant directors (for curriculum development and promotion/production), and a materials distribution specialist. A 10-member Standing Committee on Continuing Education of the Bar, which includes professors and practicing lawyers, serves in an advisory role to the Division of Professional Education.

## Finances

With a 1980-81 budget of $460,000 (and an estimated budget of $489,000 for 1981-82), the consortium receives approximately 45 percent of its revenues from the rental and sale of videotapes and 55 percent from the American Bar Endowment. Major expenditures include personnel ($220,000), new production ($100,000), videotape duplication ($60,000), and promotion ($50,000). No consortial fees are charged. Program rental and purchase costs vary considerably and depend on the length of the tape and the extensiveness of the supplementary print materials.

## Resources Available

A comprehensive catalog describing available programs and costs; selected articles describing the consortium and the experimental Interactive Videolaw Seminar.

# AMERICAN DIETETIC ASSOCIATION (ADA)

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**Telecommunications Program**
NEWSTARS

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## Educational Mission

NEWSTARS, which began in 1979, produces and conducts short professional continuing education courses with continuing education credit options for the membership of the American Dietetic Association. Courses deal with topics relevant to the professional needs of the 43,000 professional dietitians nationwide who belong to the ADA, 95 percent of whom are women. About 10 percent of ADA members have advanced degrees and virtually all have full-time salaries averaging $15,500. Since NEWSTARS is not a campus-based organization, it reaches ADA members at or near their workplaces in urban and rural locations throughout the country. Twice NEWSTARS has produced courses with professionally related cosponsors: The American Medical Association and the American Diabetes Association.

## Telecommunications Technologies

NEWSTARS broadcasts live programs via the Weststar satellite or, occasionally, via SATCOM to limited-access hospital networks and public television stations (with ITFS systems). These in turn transmit the signal to TV viewing rooms, where the dietitians/students assemble. The rooms also are equipped with telephones so that students can call in questions during the program. Satellite-to-cable linkages have been used with varying degrees of success. The ADA also makes available edited video cassette packages of live-broadcast programs.

## Curriculum

Courses are specifically designed to meet the continuing education requirements of professional dietitians, and most course topics deal with current issues or developments in clinical dietetic practice. For example, courses have included subjects such as feeding the cancer patient, dealing with obesity, and managing food service. NEWSTAR's courses are one-time, single-session programs, generally three hours long. When the project was in experimental stages (then called "Stardate"), multiple-session courses were offered. NEWSTARS had produced eight live-broadcast programs as of spring 1981, an average of one every three or four months. All courses have study packets that include an introduction, outline, bibliography, glossary, charts, tables, quizzes, evaluation forms, and article reprints. NEWSTARS does not acquire courses from others, but it does make available for sale or rental the video cassette programs that are prepared following the initial broadcast of the course.

## Faculty Roles

Since the ADA does not have a faculty of its own, it contracts with prominent dietitians, physicians, and other health professionals to develop and present courses on topics selected by NEWSTARS staff. Course development includes planning the program, preparing the study guide, and, finally presenting the course on live broadcast. Student interaction with program speakers occurs during the live broadcast through call-in questions. Course developers and presenters are paid an honorarium plus expenses for their services. The national exposure they receive is an additional incentive to participation.

## Delivery System

A few weeks prior to the course broadcast, and subsequent to mail preregistration, students receive their study packets. Courses are televised on a contract basis from public broadcast studios to some 170 prearranged viewing sites in hospitals and in public television studios in rural, suburban, and urban locations across the country. Site arrangements are handled by local coordinators. Following the course presentation, students mail in quiz and program evaluation forms. Formal interactions with instructors are limited to telephoned questions to presenters during the program broadcast.

## Enrollment

NEWSTARS' course enrollment ranges from 1,200 to 1,600 students, with an average of 1,500 students per course.

### Noteworthy Features

- uses video teleconferencing (via satellite) to deliver professional continuing education on a regular basis, one of few nonprofit organizations to do so
- is able to deliver professional education to dietitians in areas where there are no other professional learning opportunities
- provides many learners with access to major figures in the profession
- reaches large national audiences simultaneously
- has a cost-effective and convenient delivery system for professional continuing education

### Problems Encountered:

- dealing with local technical problems, which are particularly complex because of the large number of viewing sites (170)
- arranging site commitments far enough in advance to permit timely preregistration and coordination at 170 separate sites
- determining how to offer cost-effective multiple-session courses to a widely dispersed student clientele requiring considerable support services
- overcoming the logistical complexities of providing a national educational delivery system
- overcoming the incongruities between the geographical distribution of association members and the franchise areas of cable companies that might participate in a satellite-to-cable educational delivery system

### Observations About Distance Learning:

- distance learners prefer highly structured programs
- distance learners appreciate the opportunity to ask questions of the instructors during the broadcasts
- three hours seems to be the limit of the amount of program time professionally involved adults will tolerate (even with a break)

### Future Plans

- continue NEWSTARS as it is at present, with three or four broadcasts a year
- develop sequential, multiple-session courses for distribution as video cassette packages

### Contact Person

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## Administrative Structure

NEWSTARS is one project of the continuing education program of the American Dietetic Association. A permanent production staff and studio is not maintained; course production is handled on a project basis. One professional staff member devotes about a third of his or her time to NEWSTARS, and two full-time office workers handle administration, coordination, and mailings.

## Finances

Stardate, the pilot program that preceded NEWSTARS, was supported in part by an NIE grant. However, NEWSTARS is self-supporting, relying solely on course fees ($39 per student). The budget for the production and staging of each course can range from $30,000 to $45,000, including: honoraria and travel expenses of faculty and speakers, a producer/director on contract, studio production fees, satellite time, fee collection at viewing sites, printing and mailing of course announcement brochures and student packets, preparation of any pretaped segments or illustrations, and central and local site coordination. The videocassette course programs, which are a spin-off of NEWSTAR's live broadcasts, also are expected to be self-supporting.

## Resources Available

Video cassette packages, brochures, magazines, and journal articles.

# APPALACHIAN COMMUNITY SERVICE NETWORK (ACSN) *

## Educational Mission

ACSN is a nationwide satellite communications network offering educational programming that includes college credit telecourses, professional continuing education courses and personal enrichment programming. ACSN serves as a distributor of educational services to undergraduate and graduate institutions, professional associations, and the community at large. In each of its programming areas ACSN is able to provide live, interactive meetings and workshops as well as prerecorded video material. Academic credit is available through participating colleges and universities; ACSN is not itself a credit-granting agency.

ACSN has evolved from an experimental program providing teacher education in rural Aappalachia to a network with the capacity to provide numerous education services to adults in the United States. Other than saying that students served by ACSN are primarily working adults, it is difficult to characterize them more accurately because ACSN serves so many institutions and communities.

## Telecommunications Technologies

ACSN has secured satellite time on RCA's SATCOM III R, which is the primary satellite serving the cable industry. ACSN's programming is transmitted to the satellite from its uplink facility in Lexington, Kentucky, and then beamed to affiliated cable companies and community sites equipped with receive-only terminals adjacent to a library, school, or other community facility. In addition, tape delay or programming using video cassettes is used to facilitate access to programming at times convenient to learners. The telephone is used extensively for live, interactive meetings and in faculty/student interaction at the local institutional level.

## Curriculum

When it was begun in the early 1970s by the Appalachian Regional Commission, ACSN's primary mission was teacher education. Today, its college credit programming also includes undergraduate liberal arts core and elective courses. Both graduate and undergraduate courses use the television course or "telecourse" format, in which students registered at local colleges and universities view a specified number of video lessons and perform related assignments in textbooks and study guides under the supervision of institutional faculty members. ACSN staff acquire these telecourses from national producers. Although they make some adaptations in the print and video components of the graduate courses, they make almost none in the undergraduate courses.

The professional development and continuing education programming, up to this point, has focused primarily on the needs of health care professionals, social workers, adult educators, and elementary and secondary teachers. Unlike the college credit courses, these programs provide specialized training for continuing education credits (CEUs) through professional associations, state licensing boards, and other certifying agencies. These services and courses are usually developed for, and included in, ACSN's schedule at the request of, and in cooperation with, an organization offering CEUs for the programming.

Community service information programming addresses individual issues of interest to the viewing public on a one-time or continuing basis. No college credit is offered for these programs. Programming includes topics such as parenting, race relations, alcohol abuse, interpersonal communications, energy conservation, environmental sciences, economics, folklore, music, and crafts.

## Faculty Roles

Faculty at institutions that are part of the ACSN network rarely participate in the production of lower-division undergraduate courses because most of these telecourses are acquired from various national producers and distributors. However, faculty are centrally involved in the delivery of these courses at the local level. ACSN staff recommend that faculty meet with their telecourse students three to five times during the semester for required activities and testing. They also recommend extensive faculty/student interaction via telephone and mail. Not surprisingly, there is considerable variation in faculty roles at the various institutions participating in the ACSN network. In

## Noteworthy Features

- operates the largest educational satellite network in the United States
- is programming on a national basis 64 hours per week
- is able to serve both community educational sites and the entire cable industry
- is the first satellite network to offer professional continuing education on a national basis
- serves as a broker of educational services (with national capability), assisting local educational institutions in their efforts to provide credit and noncredit courses
- supplements prerecorded video programming with live, interactive (one-way video, two-way audio) seminars
- provides on-site in-service training, print materials, and teleconferences to help affiliated colleges and universities effectively deliver educational programming to distance learners
- is able to provide nationwide teleconferences for special meetings and conferences
- schedules programming two years in advance to facilitate academic planning

## Problems Encountered

- developing support systems that provide ACSN with sufficient control and local colleges with autonomy
- developing a control mechanism for continuing education courses not offered in a college setting
- working out pricing policies that are equitable for diverse types of institutions
- dealing with different academic schedules (quarters, semesters) in planning a single national broadcast schedule
- overcoming faculty resistance to televised courses "not invented here"
- being able to transmit over satellite only until 7 p.m. eastern time

## Observations About Distance Learning

- educational institutions often

need guidance and in-service training to offer telecourses
- most educational professionals are products of a print-based educational system and often do not appreciate ways in which the younger generations respond to electronic media
- some learners of any generation are more responsive to learning content via electronic media than others
- courses with interactive seminars plus prerecorded video segments are much more expensive to conduct than those that rely entirely upon telecourses for the video component

### Future Plans

- extend programming hours
- expand and diversify professional continuing education programming
- acquire space on a second satellite transponder
- organize programming into large blocks aimed at various audiences concerned with health, business, etc.

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an effort to ensure the most effective implementation of the telecourses, ACSN staff frequently offer network institutions in-service training sessions for faculty and staff as well as a *Telecourse Utilization Guide*. In addition, administrator and instructor guidebooks are generally provided by the producers of each telecourse.

Graduate courses operate in almost exactly the same manner, except local faculty may choose to supplement the telecourses with their own video or print materials. In the case of the professional development courses, the content experts are college faculty and/or professional association members. Their role is either to select existing professional development courses or to assist ACSN staff in the production of the video and print components of a course or workshop. The level of interaction between the content experts and the professional development students depends on the policies of the cooperating professional association.

## Delivery System

The ACSN satellite network currently provides programming 64 hours per week, 7 days a week to 20 community-receive sites and 220 cable systems, which serve over 1.5 million subscribers in 42 states. Although most of the states are in the eastern time zone, the network is expanding and already includes sites in many other states.

Programming is a mixture of taped and live interactive television broadcasts, supplemented by extensive print components and face-to-face telephone and written faculty/student interaction. The division of responsibilities between ACSN and local institutions in the delivery of credit educational programming can be summarized as follows:

ACSN responsibilities
- paying lease and copyright fees
- notifying affiliates of copyright limitations
- maintaining enrollment information on how, when, and where the courses are being used throughout the network
- developing evaluation materials to aid the local instructor and providing information for evaluating course effectiveness
- distributing programming

Local institution responsibilities
- securing academic credit
- handling local promotion/recruitment/registration
- ordering course materials
- providing a local instructor
- administering ACSN evaluation instruments
- assigning grades
- reporting enrollment data
- adhering to copyright limitations on the use of each telecourse
- developing handouts for students describing local course arrangements

ACSN's satellite system gives local institutions the flexibility to offer courses at the time they are broadcast nationally or to tape the video portion and make it available at a later time. They also have the option of having students view the video segments in their homes (via cable), in group viewing sites (community-receive sites or cable outlets), or on video cassettes at local libraries or learning centers. Each week's telecourse lessons are transmitted over the satellite at three different times per week. ACSN currently offers seven to ten telecourses each semester.

## Enrollment

Even though ACSN has offered courses since 1973, it has been a nonprofit corporation only since 1980. The total college credit enrollment during the 1981-82 academic year was approximately 3,000; this does not include professional continuing education or personal enrichment courses. There are currently 70 colleges and universities participating in ACSN services.

## Administrative Structure

ACSN is a nonprofit, tax-exempt corporation formed in 1980. It was begun in 1973 by the Appalachian Regional Commission as the Appalachian Education Satellite Project, a demonstration project providing educational programming to rural areas in eight Appalachian states. ACSN's Central Staff, headquartered in Washington, D.C., includes executive, legal, and administrative offices. The ACSN Regional Office in Lexington, Kentucky is responsible for the design, broadcast, and evaluation of programming.

ACSN has 50 full-time staff in its Washington and Lexington offices.

## Finances

Along with ACSN's recent transition to an independent corporation has come a sharp reduction in the proportion of federal money that supports its operation. Dependence on operating grants was cut from 93 percent in 1980 to approximately 60 percent in 1981, and it is expected to drop substantially by 1983. These funds are being replaced by earned revenue from affiliated colleges and universities. As of May 1982, cable companies that carry the ACSN schedule pay a small monthly per subscriber fee. Institutional users pay ACSN $25 per student enrolled in undergraduate courses and $40 per student enrolled in graduate courses. Fees for professional development courses vary, depending on the design of the course and the policies of the cooperating professional association.

## Resources Available

*Telecourse Utilization Guide, Professional Development and Community Service Programs,* ACSN Newsletter, ACSN program schedule, "Teleconferencing Overview."

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* In September, 1982, ACSN changed its name to The Learning Channel.

# ASSOCIATION FOR CONTINUING EDUCATION (ACE)

### Noteworthy Features

- operates an employer-based organization that provides professional continuing education for employees by developing its own courses and by contracting with postsecondary institutions for services
- directly involves the corporate and governmental communities in selecting and developing its courses and programs
- plays a "brokering" role—once a learning need is identified by member firms and organizations, ACE then locates and makes available the needed learning resources (i.e., curriculum, instructor, credit from local educational institutions)
- has a membership base of high technology companies and organizations
- directly markets educational services to corporations

### Problems Encountered

- marketing ACE's services to both the industrial and education communities
- maintaining quality control over development and delivery of the courses

### Observations About Distance Learning

- programs such as ACE develop a following; each year, many of the same individuals enroll in new courses
- degree programs in business can be marketed to high-technology firms, and perhaps to others, under the rubric of "management education" or "management training"
- many learners participate because they are trying to solve a particular problem by gaining a new skill or new knowledge; their reward is a new view of themselves and support from their peers and colleagues, rather than earning academic credit, earning a degree, or attending classes "just to learn"
- for purposes of programming for adult learners, it seems more use-

## Educational Mission

The Association for Continuing Education, using the facilities of the Stanford Instructional Television Network (SITN), develops and delivers credit and noncredit courses and programs to worksites, serving mid-career professional and technical personnel whose companies are members of the Association. ACE delivers programs to 35 high-technology private and governmental firms in the San Francisco Bay area. The average student is a working adult between 35 and 45 years of age. Half of the students are women. Although no records are kept on concurrent enrollment of ACE students at local colleges and universities, it is likely that many are so enrolled.

## Telecommunications Technologies

ACE leases the Stanford Instructional Television Network's (SITN) closed-circuit ITFS facilities (i.e., studios, air time) to provide live interactive broadcasts to worksites via one-way video and two-way audio during early morning, noon, and late afternoon/early evening hours. Telephones are also used for interaction between students and faculty (a description of SITN is included in this book under Stanford University.)

## Curriculum

ACE offers an MBA degree program through Golden Gate University; special certificate programs in management, supervisory training, mathematics, computer programming, engineering technology, and personal skills development; and general interest courses. Of the 73 courses offered in 1979-80, about 42 percent were in the "general interest" category—for example, solar energy, memory improvement, career planning, home cash management—and carried no credit. The MBA program can be completed in two years.

ACE is not an accredited institution; it works with a number of local colleges and universities (i.e., College of Notre Dame, Cogswell College, San Jose State University, Golden Gate University, members of the Bay Area Community College Television Consortium) to make undergraduate and graduate courses available to company employees. ACE staff and company managers work together closely to develop the curriculum. This "user-based" course selection and development process is designed to provide course and program offerings highly responsive to the interests and needs of member-organization employees.

## Faculty roles

Most ACE faculty are employed professionals who teach on a part-time basis. Only about 20 percent of ACE faculty are affiliated with a local campus. When the ACE general manager and company management develop a for-credit course or program idea and want it to be taught by an instructor who is not affiliated with a campus, a local institution is approached and asked to review the instructor's credentials before approving the course for credit.

Many methods are used to encourage interaction between students and instructors. Telephone office hours are established; students are encouraged to visit a campus periodically to meet with the instructor; occasional no-host dinners are held on the campus; and, for some courses, Saturday workshops and seminars are held. All instructors receive hourly fees and support budgets from ACE, except those associated with the MBA program. This latter group is reimbursed by Golden Gate University.

## Delivery System

Courses are broadcast to 60 different employment sites in the San Francisco Bay area, sites representing 35 private companies and governmental agencies that have invested in the necessary technical equipment to receive the broadcasts. Courses are scheduled for weekdays before 9 a.m., from noon to 1 p.m., and after 4 or 5 p.m. to 7:30 p.m. ACE maintains a growing videotape course library and is beginning to provide a videotape service to ACE member firms and agencies. ACE also maintains its own bookstore. Whenever possible, all course support materials (e.g., textbooks, assignments, lecture notes, etc.) are distributed by courier to the students at company locations, on a daily basis, while courses are in session.

## Enrollment

Established in 1968, ACE has served more than 26,000 students; more than 200 have completed MBA degrees. In 1980-81 enrollment was approximately 3,000, distributed as follows: 33 percent in general interest courses; 20 percent in management development and MBA foundation courses; 16 percent in MBA degree courses; 14 percent in the supervisory training program; and the rest in engineering technology, math/computer programming, or special interest programs. After substantial annual growth from 1973 to 1977, enrollment has stabilized at around 2,900 to 3,000 per year. These figures include students who enrolled after the last course refund date (end of the first week of the quarter). Most students complete ACE courses; the course completion rate average is about 85 to 90 percent.

## Administrative Structure

ACE is governed by a board of directors, with elected representation from participating ACE member firms and organizations. ACE membership currently includes only those firms with access to SITN.

ACE is housed at Stanford University. The chief administrative officer of ACE is the general manager, who reports to the board.

A partial list of participating companies includes Avantek, Ampex, Ford Aerospace, GTE Products, Hewlett-Packard, Intel, IBM, Standard Oil of California, Varian, and Xerox.

## Finances

Support for ACE operation comes from annual or "pay as you go" fees from member companies and organizations, tuition payments from students or from companies on behalf of their students, fees from a video recording studio to duplicate tapes for member organizations, the sale or lease of videotaped courses, and fees for production/delivery of custom-designed courses and related educational services for select companies. Annual subscribers pay an annual service fee and receive special tuition fee discounts.

The annual operating budget is about $435,000. Staff includes a full-time general manager and three full-time support staff. Major expense items are the cost of using SITN facilities, faculty salaries, tuition payments to sponsoring colleges and universities (for credit courses an additional fee is charged, payable to the institution awarding the credit), and administrative overhead (about 35 percent of the total budget). For the past 11 years, five companies have maintained their annual subscription affiliation with ACE.

## Resources Available

ACE mission statement, articles of incorporation, and by-laws; an article, "Guidelines for Implementing a User-Based Approach to Continuing Education for Professionals in High Technology Fields;" an article describing the Stanford Instructional Television Network; a schedule of televised classes, fee schedules, registration deadlines, etc.; and preview materials, available for a fee ($70 for a set of notes and a copy of a lecture).

ful to view intelligence as a series of human capabilities rather than as one characteristic people may possess to a greater or lesser extent: individuals may excel in one area of learning, yet perform poorly in others

## Future Plans

- increase the number of female instructors
- increase ACE affiliations with many kinds of postsecondary institutions;
- increase the videotape exchange program with other producers
- explore the use of satellites
- establish a national ACE center to encourage networking and avoid duplication
- encourage the development of programs similar to ACE in other parts of the country

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# THE ASSOCIATION FOR HIGHER EDUCATION OF NORTH TEXAS (AHE)

### Noteworthy Features

- constitutes the largest closed-circuit, higher education network in the United States
- elicits extensive cooperation from educational, business, and community leaders
- has an organizational structure that shares governing powers between the community (two-thirds) and higher education institutions (one-third)
- has developed a hybrid distribution system using ITFS broadcast, point-to-point microwave, cable, satellite, video cassette, and telephone
- offers credit, noncredit, undergraduate, graduate, and professional development programming
- serves as the equivalent of a telecommunications utility for a metropolitan area encompassing two large cities (Dallas and Fort Worth)
- combines complex technology and low-cost video production to serve highly motivated learners

### Problems Encountered

- working with a situation in which TAGER television network is currently used at only 70 percent of its capacity, in part because faculty do not want to teach at irregular hours
- determining how to adapt a straightforward, unembellished approach to the use of television for instruction to other types of learners (e.g., undergraduates) who may be less highly motivated than working professionals
- convincing some educational institutions to use existing TAGER services or to expand their current capacity
- convincing faculty that using television for instruction can be relatively inexpensive and unobtrusive
- obtaining funds for the equipment and staff required to originate video and print instructional materials and to demonstrate potential new services

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## Telecommunications Program

TAGER Television Network

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## Educational Mission

The Association for Higher Education of North Texas (AHE) was incorporated in September 1980 through a merger of The Association for Graduate Education and Research in North Texas (TAGER) and the Interuniversity Council. The resulting association has 17 participating higher education institutions.

The TAGER Television Network, since its founding in 1967, has attempted to foster academic resource-sharing and better meet regional needs in higher education by linking colleges, universities, and industries in the Dallas/Fort Worth area via interactive television. The TAGER network serves as a telecommunications utility for the business and higher educational communities of north Texas. It offers graduate and undergraduate, credit, and noncredit television courses to corporate employees ("outreach students") at their worksites and to students at their own campuses who receive televised courses from other campuses ("inter-institutional students").

Ninety percent of the TAGER courses are credit-bearing, and 85 percent are graduate-level engineering, business, and computer science courses. Although 90 percent of the courses are live and interactive, TAGER does offer some prerecorded short courses on a variety of technical and management topics. Most (78 percent) students are males between 24 and 32 years of age. The student clientele more accurately reflects the ethnic and socioeconomic mix of the engineering and business professions than the general population of north Texas.

## Telecommunications Technologies

The TAGER network distributes its live and videotaped television courses via four Instructional Television Fixed Service (ITFS) broadcast channels, point-to-point high frequency microwave links, and local cable companies. Most programming is one-way video and two-way audio, but, for certain courses, two-way video is also used. The two-way audio communication can be either by microwave or dedicated telephone line, or both. With some exceptions, most of the colleges are connected to the TAGER network switching center via point-to-point microwave channels, and most corporate facilities are linked via ITFS broadcast channels. In this closed-circuit, multi-channel network, courses originate in a production studio or studio/classroom (with two fixed cameras) at the offering institution and are then directed by the TAGER switching center to classrooms off campus or to other campuses equipped to receive the microwave signal.

TAGER is currently linked to cable companies in 26 suburban communities and will soon have completed construction of a satellite earth station (downlink). TAGER is also increasing its transmission power and will be able to distribute courses to all cable television companies operating in the Dallas/Fort Worth metropolitan area.

## Curriculum

Outreach students located in various corporate or medical sites in the community choose graduate and undergraduate courses in biology, business administration, chemistry, computer science, education, engineering, geography, geoscience, history, mathematics, physics, and statistics. Inter-institutional students can choose the same courses plus some foreign and classical language subjects.

## Faculty Roles

Ninety percent of the courses are broadcast live from classrooms equipped with fixed overhead and head-on cameras. Faculty members normally sit at a desk and write on a pad of blue paper. This pad is recorded by the overhead camera. Some classrooms are also equipped with blackboards for the faculty to write on. Television monitors in the classroom pick up the faculty member's notations so the students in the on-campus classroom can see them. Students at the remote sites can ask questions or make comments by speaking into a talkback telephone instrument, which enables them to be heard by the faculty member and all other class participants. The system was designed to be as unobtrusive as possible in order to gain faculty acceptance.

### Delivery System

Most TAGER courses include three hours of televised class sessions per week. Each corporation on the TAGER network assigns a representative, called an industrial coordinator, to serve as liaison with the TAGER staff. The industrial coordinator's role is to support the outreach students by distributing information about TAGER, assisting with registration and classroom scheduling, proctoring exams, and providing feedback to the network staff. Likewise, each higher education institution in the TAGER network appoints a campus director to provide many of the same services to inter-institutional students. Most learning activities take place at the students' workplace or home campus, but faculty can require them to come to the campus of the originating institution as often as twice a semester for meetings or exams. The TAGER staff make available (at cost) a videotape service for students or faculty who notify them ahead of time that they will miss a scheduled class meeting and need to have a videotape for future replay. The TAGER network serves 37 classrooms in the Dallas/Fort Worth area. Course materials are distributed to these off-campus classrooms and to educational institutions by a courier service, which makes daily deliveries and pickups. (See "Faculty Roles" for more detail on how courses are delivered.)

The TAGER network is also connected to cable companies that serve 26 suburban communities and over 100,000 homes. When the Dallas metropolitan cable system is fully in place, TAGER will have access to an estimated one million subscribers. Currently, TAGER transmits Dallas County Community College District telecourses to its cable outlets.

### Enrollment

In the 1981-82 academic year more than 2060 students took credit courses and 428 took noncredit courses over the TAGER network. Since 1967 TAGER has delivered credit courses to more than 20,000 students. In recent years registration for TAGER courses has been growing at a rate of over 20 percent a year.

### Administrative Structure

The Association for Higher Education is a nonprofit organization controlled by a board of trustees. Two-thirds of the board members are from the lay community and one-third is from its 17 participating educational institutions. Community members are drawn from the corporate vice-president level; the educators hold positions at the chief executive level. The board is self-perpetuating, selecting its own members for three-year terms. The board has legal control of all AHE capital and equipment and determines policy with input from the AHE staff. Unlike most inter-institutional cooperative efforts in which educational institutions participate, the educators can be outvoted by the majority of community members. Thus, AHE has a clear mandate to serve the community as well as the educational institutions.

The AHE board of trustees is divided into working committees that focus on various aspects of the associations' activities and assist the president and staff of AHE. The AHE staff consists of 23 full-time-equivalent employees. The staff is also assisted by three advisory committees: campus directors, industrial coordinators, and business outreach.

Not all AHE institutions participate in the TAGER network. Currently 10 of the 17 members participate. They are: Austin College, Dallas Baptist College, Dallas County Community College District, Southern Methodist University, Texas Christian University, Texas Wesleyan College, University of Dallas, The University of Texas Health Science Center at Dallas, the Univeristy of Texas at Dallas, and the University of Texas at Arlington. Current corporate subscribers include Texas Instruments, General Dynamics, Rockwell International, Mostek, Xerox, ARCO, E-Systems, and Frito-Lay.

### Finances

The overall operating budget for the TAGER network is $471,000, plus an additional $44,000 for the courier service. Not all AHE members participate in the TAGER network; those that do, like the industries, pay varying fees depending on the services they use. Educational institutions pay a fixed fee of $3,000 to use the TAGER sys-

- responding to the potential consequences of recent Federal Communications Commission rulings that encourage high volume, entertainment-oriented users like direct broadcast satellite (DBS) networks at the expense of a technology like ITFS (which is often used as a link between educational organizations and cable companies operating in a local region)
- striking a balance between the needs of the educational institutions and the community as a whole
- determining why the response to the professional development series courses (videotaped short courses) has been disappointing

### Observations About Distance Learning

- obtaining and maintaining successful inter-institutional cooperative activities requires consistent and intense effort on the part of a central staff
- ITFS is an ideal technology for linking educational organizations to one another and to cable companies operating in the same region
- support services (e.g., courier service between colleges and businesses) are essential to the smooth operation of the distance learning delivery system
- learners and faculty respond much more favorably to interactive than to one-way delivery technologies

### Future Plans

- explore the possibilities of delivering more types of undergraduate and noncredit curricula
- broadcast on four cable channels once the new Dallas cable franchise is in place
- "narrowcast" programming on four additional Dallas cable channels to specific home and corporate subscribers paying for special educational services

- explore the possibilities of using current and future satellite links to bring in educational programming from other locations and to transmit educational programming originating at TAGER institutions on a national basis

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tem. Institutions also pay the cost of 45 air hours per semester for typical three-credit courses. This amounts to $1,100 per time slot if the programming goes to a business or industry and (as an incentive to inter-institutional cooperation) $100 per time slot if it goes to another educational institution. Institutions accept responsibility for maintaining their own equipment, but they can pay extra to have TAGER handle this task.

In addition, institutions pay an annual fee to belong to AHE whether or not they participate in TAGER.

Business and industry participants pay TAGER between $5,000 to $15,000 in up-front installation costs, plus $3,400 annually and $60 for each student served. This is in adddition to the tuition paid to the individual colleges. In 90 percent of the cases, tuition charges for outreach students are paid by the employers.

In addition to fees from educational institutions and industry, AHE has received a grant of $174,000 from the National Telecommunications Information Agency plus $58,000 from local sources to construct a satellite earth station, increase transmission power, and purchase computer and graphics support equipment. Major expenses for the TAGER television network include staff salaries, equipment purchase and maintenance, and the courier service.

## Resources Available

TAGER Television Network Bulletin (list of courses), professional development series course list, general marketing information, press releases.

# ASSOCIATION FOR MEDIA-BASED CONTINUING EDUCATION FOR ENGINEERS, INC. (AMCEE)

## Telecommunications Program

The AMCEE consortium consists of the following member institutions:

Auburn University
Colorado State University
Georgia Institute of Technology
Illinois Institute of Technology
Massachusetts Institute of Technology
Michigan Technological University
North Carolina State University
Polytechnic Institute of New York
Purdue University
Southern Methodist University
Stanford University
University of Arizona
University of Idaho
University of Illinois at Urbana-Champaign
University of Kentucky
University of Maryland
University of Massachusetts
University of Michigan
University of Minnesota
University of South Carolina
University of Southern California

## Educational Mission

AMCEE is a private, nonprofit educational association with 21 member institutions from all over the United States. It was formed in 1976 by representatives of 12 engineering schools. Before forming AMCEE, each of these schools was independently offering television-based courses at the graduate level to on-the-job engineers at their places of work. Two of the schools were already developing and distributing noncredit, studio-produced short courses aimed at the midcareer engineer clientele. The association also serves as a distribution mechanism for those courses member institutions choose to have marketed nationally. AMCEE courses are intended for engineers, industrial scientists, and technical managers who want either credit or noncredit continuing education. AMCEE courses are taken both by young and midcareer professionals who are seeking refresher courses or graduate degrees. Approximately 37 percent are between 20 and 30 years of age; 26 percent are between 30 and 40; and 33 percent are over 40. The majority are male. The firms employing these professionals vary in size from 110 to 10,000 employees.

AMCEE produces and distributes videotaped instructional materials. Videotapes produced by AMCEE and a few of its member institutions are recorded in studio facilities, but videotapes produced by most AMCEE member institutions are recorded in live campus classroom situations.

## Curriculum

The AMCEE curriculum includes over 480 courses in 18 disciplines produced by 21 member institutions and by AMCEE itself. In addition to customary curricula such as civil, electrical, mechanical, chemical, agricultural, and petroleum engineering, AMCEE also offers related courses in business administration, economics, and finance. Videotaped courses produced by member institutions are almost exclusively recordings of live classroom instruction, using two or more fixed television cameras.

The educational material developed by the AMCEE headquarters staff includes short courses, conferences, and symposia produced with private funds and videotaped in the studio facilities of various member institutions. These studio-produced courses serve to generate revenue for AMCEE and also to demonstrate to less experienced member institutions how they can produce high quality video taped instruction in a cost-effective manner. AMCEE staff seek to encourage a balance between the logistical and financial advantages of videotaped live classes ("candid classroom") and the pedagogical and marketing advantages of studio-produced courses.

## Faculty Roles

The engineering faculty whose classes are videotaped in either the classroom or the studio have complete control over class content and presentation. Departmental faculty and engineering school administrators at each member institution decide which courses to videotape, which to market to local industries, and which to list in the AMCEE catalog for national distribution.

## Delivery System

Courses in the AMCEE catalog are normally offered by employers seeking to provide

### Noteworthy Features

- helps overcome barriers to distance learning posed by local and state boundaries by making the locally produced videotape courses of engineering schools available to practicing professionals anywhere in the country
- offers a national service that encourages engineering schools to offer credit not only to local continuing education students, but also to distance learners
- experiments with methods that enhance videotaped continuing education by combining various aspects of the "candid classroom" and the production studio approaches
- constitutes one of the few major professional organizations with a fully developed national distribution network for continuing education

### Problems Encountered

- establishing common formats for videotaped courses of member institutions to improve national marketability
- assisting member institutions in their efforts to learn how to produce videotaped courses
- encouraging member institutions to devise rewards for faculty involved in course production
- mastering the logistics of tape distribution
- achieving self-sufficiency

### Observations About Distance Learning

- candid classroom versions of live presentations are much less acceptable for marketing on a national scale than they are in the locale of the institution that produces them
- highly motivated learners respond positively to lower-cost television productions

### Future Plans

- use satellite links to the job site and member-ITFS systems as an alternative distribution mechanism

- experiment with the use of computers for test grading and student feedback
- increase options for obtaining credit at a distance
- develop more short courses aimed primarily at midcareer professionals
- expand cooperative activities with other professional associations
- achieve self-sufficiency by 1983-84

## Contact Person

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continuing education to their engineers, industrial scientists, or technical managers. Company education and training staff generally arrange for a small group of employees to view the videotaped classes at the worksite before, during, or after work hours. In some cases a company employee with expertise in the course topic will serve as a peer tutor.

Standard textbooks and handouts accompany all live classroom videotaped courses. Specially designed study guides and regular texts accompany the studio-produced short courses. Students taking courses for credit take proctored exams prepared and graded by the faculty for the credit-granting AMCEE-member institution. Only about 10 percent of the courses in the AMCEE catalog are available on a credit basis. These credit courses represent an increasing proportion of the AMCEE course offering.

## Enrollment

Exact figures on enrollment and completion are very difficult to obtain since AMCEE leases or sells courses to employers, who, in turn, determine how many employees will participate in the courses.

## Administrative Structure

AMCEE has a 13-member board of directors, which has a six-person executive committee. The headquarters staff has grown from a single part-time executive director to a full-time executive director and three full-time and three part-time employees. The staff and board are assisted by 10 committees composed of individuals from member institutions. AMCEE also has a designated representative on the campus of each member institution whose responsibility it is to coordinate association activities locally. An industrial advisory board provides input to AMCEE from its diverse client population in business and industry. All AMCEE-member institutions are either public or private universities with a graduate engineering curriculum.

## Finances

Since it is a consortium, AMCEE benefits from the contributed time and travel of many of its members and advisors. Taking these contributions into account, the annual operating budget is approximately $800,00. The consortium was formed with the assistance of grants form the National Science Foundation and the Alfred P. Sloan Foundation. Plans call for AMCEE to be self-supporting in the 1983-84 academic year. Income sources for AMCEE also include an initial membership fee ($2,500), fees for rental and sales of tapes produced by AMCEE headquarters, commissions on rental and sale of member institution tapes, and fees from the sale of publications and study guides. Major expense include headquarters staff and offices, marketing, and the distribution of tapes owned by AMCEE headquarters. AMCEE does not maintain an inventory of videotapes produced by its member institutions. The headquarters staff takes orders, bills industrial clients, informs member institutions "to send tape y to industry z," and subsequently distributes the revenue among the member institutions and AMCEE.

## Resources Available

Newsletter, catalog of courses, brochure, membership criteria.

# BALTIMORE MAYOR'S OFFICE OF MANPOWER RESOURCES

## Telecommunications Program

The Learning Center and the Senior Services PLATO Project

## Educational Mission

The Mayor's Office of Manpower Resources is the CETA prime sponsor for the city of Baltimore. Among its many activities are two programs—one for youth and adults (16 to 55 years of age) and one for older adults (55 and over)—that use PLATO computer terminals to assist in upgrading the skills of their respective participants.

The Learning Center (TLC), which is located in downtown Baltimore, offers educational upgrading to adults with reading skills between the fourth- and eighth-grade levels. Some TLC clientele are youth (aged 16 and above) working under CETA Title IIB funds in public and private sector jobs; others are adults (aged 17 and above) learning clerical skills in cooperation with Hamilton Business Schools (a CETA subcontractor), and still others are unemployed adults (aged 18 and above) who have been referred to TLC by the CETA Manpower Service Centers. Approximately 70 percent are female, and the majority are black. Regardless of whatever training, employment, or unemployment situation they may be involved in, all TLC clientele come there for educational upgrading in basic skills and/or high school equivalency preparation.

Older adults (55 and over) can obtain academic and occupational skill training through the Senior Services PLATO Project, which is housed at the Waxter Center (a multipurpose senior center in downtown Baltimore). In addition to the academic skill development goals pursued at the TLC, the older adult program at the Waxter Center emphasizes occupational skill development and job placement. The older adults in this program are all economically disadvantaged residents of Baltimore with individual family incomes below $5,300 per year. All have reading proficiency above the fourth-grade level and the majority are black women.

*N.B. Funding for the Senior Service PLATO project from the United States Department of Labor has been terminated. However, some services to older adults still continue.*

## Telecommunications Technologies

PLATO (Programmed Logic for Automated Teaching Operations) is an interactive, computer-based education system designed to individualize learning while at the same time serving numerous learners simultaneously. The computer terminal display screen is capable of graphics symbols, alpha-numerics, animation, and rapid selective display writing and erasing. Students can use either the keyboard or a touch-sensitive panel on the display screen to interact with the computer. There are 24 PLATO terminals at The Learning Center and 8 at the Waxter Center. PLATO terminals and the compatible software have been developed by Control Data Corporation.

## Curriculum

At The Learning Center, where the emphasis is on upgrading academic (reading and math) skills and preparing for occupational skills training or jobs, adults with reading levels between fourth and eighth grade work on basic skills; those above the eighth-grade level prepare for the general educational development (GED) examination. Students with low skill levels usually spend one hour on the computer terminal and one hour with the instructor. Those at higher skill levels may spend as much as two hours on the terminals, with little assistance from the instructors. Upon completing the computer and print courseware for either the basic skills or GED of these levels, students also learn job search skills on the computer. Many adults find jobs after completing the basic skills curriculum.

In the Senior Services PLATO Project at the Waxter Center, older adults not only learn these academic skills, but also choose from among a number of occupational skill subjects available on the PLATO terminals: office skills, typing, computer science, business education, small business skills, bank teller skills, mechanical skills, and job search skills. In addition, the older adults participate in job search workshops, which involve interaction with the instructor and the computer terminal.

## Faculty Roles

In both The Learning Center and the Senior

### Noteworthy Features

- uses the computer to teach academic and occupational skills to disadvantaged younger adults and senior citizens
- provides nonthreatening instruction to adults who have had limited and/or negative educational experiences in the past
- uses the computer to raise the skill levels of disadvantaged adults so they can take advantage of further training, education, or job opportunities
- combines computer-assisted instruction with small instructor-led classes
- offers disadvantaged adults support services (job, career, and personal counseling; financial and transportation assistance)
- provides educational experiences for disadvantaged urban adults in centrally located multipurpose community facilities
- succeeds in placing 50 percent of older adult participants in jobs and in bringing academic skills of GED candidates up to the passing level of the high school equivalency test (32 out of 38 taking GED exam passed)

### Problems Encountered

- determining the appropriate mix of computer time and instructor (class) time that works best for learners at different skill levels
- maintaining funding for the Senior Services PLATO project beyond the nine-month demonstration phase
- matching the wide range of student skill levels to those curricular options available on the PLATO terminals
- compensating for limits in the range of vocabulary and reading comprehension exercises available in the PLATO software

### Observations About Distance Learning

- instruction on computer alone is much less effective than when combined with small classes led by instructors
- pretesting is an essential prerequisite to appropriate place-

ment within the PLATO curriculum (fourth-grade reading level is minimum skill level necessary)

- two to three hours is the maximum attention span for adults using computer terminals
- positive reinforcement from computer software and instructors is essential to the disadvantaged adult learner
- incentives of future job training or job placement serve to motivate adults during the educational component
- older adults adjust quickly to learning on a computer and can achieve at levels similar to those achieved by younger adults
- older adults are less willing to randomly experiment with the computer than are younger adults (older adults show more respect for the equipment)
- for older adults, the process of learning on the computer seems to increase self-confidence and aspirations for employment
- financial allowances for older adults may not be necessary to motivate them to participate in computer instruction programs

### Future Plans

- make the educational resources of The Learning Center available to more adults taking short-term training programs
- pursue permanent funding sources for the Senior Services PLATO Program to take it beyond the demonstration stage

### Contact Persons

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The Learning Center
Mayor's Office of Manpower Resources
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Charity H. Johnson, Coordinator
Senior Services
Mayor's Office of Manpower Resources
Waxter Center for Senior Citizens
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(301) 396-3630

Services PLATO Project the instructors teach the students how to use the computer terminals, answer technical and substantive questions once they are on the terminals, and work with them in small groups off the terminals. Some are called instructor/technicians, and others are called instructor/counselors. Counseling adults about their educational, training, job, career, and life plans is an important aspect of the staff's role in each project.

### Delivery System

The PLATO computer terminals are the heart of the delivery systems of both programs. All students spend at least half their class time on the terminals; some are sufficiently capable and self-motivated to spend almost all their class time at the terminals. Upon joining either program, adults are oriented to the computer, given a specific file and code name (to assure them of exclusive access to their file), and pretested for reading and math skill levels. All students participate for two to three hours per day.

Most adults in The Learning Center program receive no pay for participation, but they are given bus tokens. Some training and job programs, however, do provide participants a wage. The senior citizens in the PLATO Project at the Waxter Center receive an hourly allowance for participating in the program. Adults in TLC generally spend from three to six months in the program before being referred for job training. Most senior citizens spend an average of 19 weeks in the program.

### Enrollment

The Learning Center has 80 students in its regular adult program, 35 in its business school program, and 60 in its youth program, for a total of 175. The Senior Services PLATO Project has served 55 older adults. In The Learning Center's program, 32 of 38 adults who completed their GED coursework passed the GED exam. In the Senior Services program approximately 50 percent of the older adults are placed in jobs.

### Administrative Structure

Both The Learning Center and Senior Services programs are within the city of Baltimore Mayor's Office of Manpower Resources, which is a CETA prime sponsor. Senior Services employs four full-time staff plus a coordinator, who is assigned on a 50-percent-time basis. TLC has ten full-time and four part-time employees.

### Finances

The overall budget for TLC is approximately $130,000; for the Senior Services PLATO Project it is also approximately $130,000 (this includes allowances for the senior citizens). Major expenses in both programs include staff salaries and leases for the computer terminals. Both programs are currently supported by CETA funds channeled through the Mayor's Office of Manpower Resources. Originally The Learning Center was begun with $200,000 contributed by the Commercial Credit Company, a financial services subsidiary of Control Data Corporation, which helped develop the PLATO system. The Senior Services project is the result of a demonstration project awarded to the National Council on the Aging, Inc. (NCOA) by the U.S. Department of Labor.

### Resources Available

Pamphlet on The Learning Center and articles on both programs.

# BAY AREA COMMUNITY COLLEGE TELEVISION CONSORTIUM

## Educational Mission

The Bay Area Community College Television Consortium produces, acquires, and distributes educational media materials on behalf of 24 member community colleges in 11 central and northern California counties. Approximately one-third of all enrolled students concurrently are enrolled as on-campus students. Most are working adults in their early thirties; as a group they reflect the same sex and ethnic makeup of the on-campus population.

## Telecommunications Technologies

The consortium uses public and commercial broadcast television, cable television, and videotapes to deliver its video courses, public radio and audiotapes to deliver its audio courses, and uses the telephone for faculty-student interaction. Recently it began using the Stanford University I.T.F.S. system to deliver some courses.

## Curriculum

With the exception of some courses in business, electronics, and computer science, consortium-sponsored courses consist of a combination of elective and core liberal arts credit courses. Each year the consortium leases five courses from national distributors and participates in two or three national public broadcasting productions that have been adapted for use as courses. Recently, the consortium completed production of its first course called "Voyage," a career development course for adults. The consortium also has cooperated with two other California community consortia in the joint production of a real estate course.

## Faculty Roles

Faculty involvement in course development begins in the formative stage of course selection and design and continues with faculty members as the content experts. Production staff are hired on a project basis. Although the exact nature of their roles in course delivery varies considerably across the 24 member colleges, faculty are centrally involved in adapting course materials and supporting students via telephone, mail, and face-to-face communication. The consortium staff make special efforts to bring faculty together for orientation sessions, which focus on alternative approaches to teaching a particular course. When possible, the consortium will bring their faculty together with one of the faculty who originally developed the course at the producing institution.

## Delivery System

Television courses sponsored by the consortium are available over public and commercial broadcast stations and on local cable channels in the Greater Bay Area. In addition to reviewing television or radio course segments, students can attend three or more class meetings at an on-campus or community site. Each course has a minimum of one orientation session and several review sessions prior to both mid-term and final exams. Some courses include field trips. Most communication between faculty and student occurs by way of mail or telephone. Faculty maintain convenient office hours for phone and face-to-face conversations. Opportunities also are available for students to take make-up exams and to view videotapes and audiotapes. Recently the consortium began offering business and electronics courses to employees in industries served by the Stanford University I.T.F.S. system.

## Enrollment

Since its founding in 1973, the Bay Area Community College Consortium has provided credit courses attracting 65,700 enrollments. Each of the seven to eight courses offered per year has an average of 1,000 to 1,500 students. In 1981-82, enrollment was 4,559, with a completion rate of 75 percent. (This figure is based on an average of enrollments during the fourth and tenth weeks of the semester.)

## Administrative Structure

The consortium is a nonprofit entity organized according to the provisions of a joint-powers agreement signed by all 24 participating institutions. All decisions regarding course selection, budget, production, hiring, and other policy matters are made by the governing committee, which meets three times a year and is composed of one representative from each institution. Seven of

### Noteworthy Features

- combines the resources of 24 colleges to serve, more economically, a large population of learners
- emphasizes faculty orientation prior to course delivery
- produced a course ("Voyage"), which can be used as an undergraduate or graduate course or as a counseling tool
- developed study guides for the Shakespeare series on PBS, beginning with the third series
- was centrally involved in the development of the Northern California Community College Consortium, a cooperative effort to offer nontraditional educational options using approaches other than television (radio, audio, cassette, newspaper, travel, and mixed media)

### Problems Encountered

- working within the limits of the resources available to the consortium and its colleges for producing courses
- working with public broadcasting stations that assign a relatively low priority to instructional television
- offering courses in spite of the short lead time and last-minute schedule changes by PBS for nationally televised productions
- accepting the fact that faculty resistance to televised instruction is an ongoing problem that requires continuing attention

### Observations About Distance Learning

- approximately one-third more on-campus students than had been anticipated are taking television courses for additional credits
- the early morning hours (6 to 7 a.m.) seem to be good television-viewing times for most working adults

### Future Plans

- produce more courses
- utilize additional media to serve learners (radio, newspapers, etc.)

### Contact Person

Dr. George A. Willey, Director
Bay Area Community College
Television Consortium
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Palo Alto, California 94603
(415) 949-0525

these individuals comprise the administrative committee which meets monthly and makes recommendations to the governing committee. The staff is composed of a full-time director and a secretary.

### Finances

Consortial activities are supported by annual member fees, which vary from $3,000 to $12,000 per college district, depending on the total enrolment of the institution. The annual consortium budget is approximately $185,000. Funding for individual colleges comes from the State of California and is based upon average daily attendance (ADA). Although the consortium must pay for broadcast time from one of its local public stations, three of the commercial stations donate air time. Major expenses include air time, course acquisition, staff salaries, and production.

### Resources Available

Joint powers agreement, instructor's handbook, consortium brochure, "Voyage," brochure.

# BERKS COMMUNITY TELEVISION (BCTV), READING, PENNSYLVANIA

## Educational Mission

Berks Community Television is a nonprofit community-based organization created to encourage the exchange of information and knowledge among the citizens of Reading, Pennsylvania through the effective use of existing two-way cable television facilities. BCTV was established in March 1977 by various interested individuals and organizations from the Reading community following the termination of a two-year National Science Foundation (NSF) experiment with two-way cable. The original experiment involved a consortium that included, among others, New York University's Alternate Media Center, ATC-Berks TV Cable Company, and the city of Reading. The purpose of the NSF experiment was to design and establish three neighborhood communication centers linked together by interactive cable television and to involve senior citizens and public agencies in operating the system as well as in communicating with one another. Special emphasis was placed on training the older adults to operate the system and to develop programming, thus giving the consumers, rather than producers, of public services the incentive for developing public service applications of two-way television.

The current activities of Berks Community Television clearly are consistent with the philosophy of the NSF experiment. However, they involve an even wider range of clientele, programming, and community organizations. Among the groups involved in BCTV programming over ATC-Berks TV Cable Company's two-way channels are senior citizens, high school students, lawyers, the League of Women Voters, the World Affairs Council, the Consumer Affairs Council, the Social Security Administration, the Area Agency on Aging, the city of Reading, and state legislators.

## Telecommunications Technologies

BCTV uses the two-way (audio and video) cable television facilities of the ATC-Berks Cable Television Company. There are 65 locations in the Reading area that are wired for two-way cable. Currently, however, only BCTV, the Berks County Senior Citizen Center-Horizon Center, the Berks County Courthouse, the Social Security Administration, and three high schools regularly are equipped to operate in the two-way mode. A small studio camera, microphones, and one or more television monitors are required at each site to make two-way audio and video possible.

Resident cable subscribers are able to view the interactive programming in their homes and participate in it aurally by using their telephone to call the originating site. If they want to be seen as well as heard, they must go to one of the centers wired for two-way cable.

## Curriculum

Since no formal courses currently are offered by BCTV over the interactive cable channels in Reading, the term *curriculum* really is not appropriate. However, the nature of the programming encouraged by BCTV serves the informal educational needs of many citizens of the Reading area. Most of the programming can be characterized as information-sharing on topics of interest to different constituent groups.

The six hours of senior citizen programming each week are planned, produced, and hosted by senior citizens, and the content is geared to the interests of this population (e.g., social security, consumer issues, wills, etc.) In addition to this regular senior citizen programming, one show per week is devoted to the "Bridging the Generation Gap" project, in which students from three local high schools select topics they would like to discuss with the senior citizens over the two-way cable television system. Topics have included a wide range of subjects, such as the Iranian crisis, sex education in the schools, and drug abuse. With funds provided by the National Endowment for the Humanities (NEH), BCTV sponsored oral history programs in which senior citizens and high school students discussed issues such as the labor history of Berks County, World War II in Berks County, and being a teenager during the Depression.

In addition, 10 hours of live programs each week respond to the needs and interests of other segments of the population as well as to those of senior citizens. For example:

## Noteworthy Features

- offers live, interactive, face-to-face, informative, and educational programming over cable television
- involves older adults and other citizens in the planning, producing, and hosting of interactive television programming that is designed to meet the needs of specific groups and the population as a whole
- uses local neighborhood facilities as the origination sites for programming
- encourages communication between older adults and high school students and between public officials and citizens through interactive television
- is a community-based organization that enjoys the support of a broad cross section of individuals and organizations in the community
- enables the consumers of public services to initiate programming and to provide direct face-to-face feedback to the providers of such services
- offers citizens the option of coming to neighborhood centers or staying at home and still participating in interactive programming
- receives cooperation and some financial support from ATC-Berks Cable Television Company

## Problems Encountered

- financing a nonprofit community-based organization
- overcoming occasional technical problems involved in obtaining a split-screen image of two different participating centers
- reaching citizens who are unable to come to the neighborhood communication centers and who are not cable subscribers
- dealing with the need to use three different cable channels at different times of the day rather than one dedicated channel

## Observations About Distance Learning

- face-to-face interactive television

can break down psychological barriers between members of the community (e.g., high school students and older adults, public officials, and citizens)

- community needs for informational and educational programming are constantly shifting and evolving
- coordination of interactive community programming is a very demanding activity

### Future Plans

- explore the potential of offering college credit, professional continuing education, and noncredit courses

### Contact Person

Kate Stutzman, Executive Director
Berks Community Television
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Reading, Pennsylvania 19601
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Berks County Bar Association—your rights as a victim
League of Women Voters—current legislation in Harrisburg
World Affairs Council—the AWACs deal
Consumer Affairs Council—consumer rights
Social Security Administration—changes in social security
City Council—annual budget hearings

One of the major accomplishments of this interactive cable system has been its success in opening up communications between public officials (e.g., mayor, city council, state legislators, police) and the average citizens of the area.

### Faculty Roles

BCTV programming currently does not include formal instruction, and, therefore, there are no roles for faculty. However, like faculty in traditional classrooms, the hosts, guests, or other program presenters on BCTV programs are fair targets for all types of questions and comments from the participating viewers. The regular senior citizen programs offered three times a week are hosted by senior citizens who are responsible for the content of the segments they lead.

### Delivery System

Much of the BCTV programming produced by organizations in the community is aired once a month, or, in some cases, once a week. The older adult programming, on the other hand, is aired for two hours three mornings each week. The two hours are divided into three half-hour segments, a quarter-hour segment, and a 10-minute segment at the end. The half- and quarter-hour segments are each hosted by a different senior citizen, who is responsible for leading the discussion and introducing any guest experts or videotapes that may be used as part of the program. The final 10 minutes are used for an open party line on any topic. All segments are live and interactive and can be initiated from any of the neighborhood communications centers. Residential cable subscribers can call in to the center initiating the programming to interact with program presenters and/or others in the audience, or come to the center.

A loosely structured producers' committee composed of interested senior citizen volunteers helps decide what topics will be covered by future segments of the live morning program. BCTV offers 16 hours of live programming per week and 14 hours of video replays of live programs. Since no single channel is dedicated to BCTV use, three different channels are used at different times of the day. Viewers are informed of upcoming BCTV programs through a printed weekly schedule, a quarterly newsletter, and newspaper listings.

### Enrollment

The term *audience* is more appropriate in this case. Although specific figures on citizen participation are not available, it is known from a 1979 survey of the 46,000 ATC-Berks Cable Television Company subscribers that over 51 percent watch some BCTV programming. More specifically, 28.3 percent indicated they watched more than one program per week, and 23.5 percent said they watched less than one program per week. BCTV receives approximately 300 calls into its programs each month.

### Administrative Structure

Berks Community Television is a nonprofit, community-based organization that is governed by a board of directors composed of representatives from the business, civic, educational, religious, and senior citizen segments of the community. A program committee composed of community representatives has overall responsibility for planning BCTV program topics. BCTV staff includes seven full-time employees and one part-time employee.

### Finances

For 1982, the overall annual operating budget of BCTV is $175,000. Sources of income include ATC-Berks Cable Television Company (approximately one-third of the annual operating budget plus in-kind technical assistance), the Reading City Council, the Human Relations Council, and grants (e.g., NEH oral history project). Major expenses include production, staff, rent, equipment, and supplies.

### Resources Available

Weekly program schedule, quarterly newsletter, videotapes on request.

# CABLE ADVISORY BOARD FOR LEARNING AND EDUCATION (CABLE)

## Educational Mission

The CABLE consortium seeks to ensure equal access to educational programming by public and private institutions and organizations. Such programming is available on the local educational cable television channels from Spokane, Washington, thereby further extending educational opportunities to community residents. The typical student is somewhat older (average age about 26) than the on-campus student attending classes at the local community college in the Spokane area. Additional data on student characteristics are not currently available. (For a description of CABLE and its member organizations, refer to the "Administrative Structure" section of this description.)

## Telecommunications Technologies

The consortium makes use of a five-channel cable television system. Though not developed currently, the system has the capacity for two-way video to institutional or agency sites but not to private residences.

## Curriculum

To date, the consortium primarily has offered lower-division, liberal arts credit courses sponsored by Community College District #17 of Spokane. In 1979-80, all seven courses aired were leased from outside agencies or institutions by Community College District #17. Faculty at the college have developed supplementary printed materials to accompany the study guides and textbooks that come with the leased telecourses.

## Faculty Roles

Each consortium institution is responsible for developing its own course selection process and managing its own instructional program. Most typically, local faculty identify for careful review and selection courses developed elsewhere. Faculty determine what additional supplementary materials or learning experiences are needed to enhance the acquired courses and, then, usually develop a comprehensive course handbook. Each institution also manages its own system for compensating instructors who coordinate the telecourses.

## Delivery System

The consortium contracts with the local public broadcasting station to schedule classes over the cable network. Individual consortium members are responsible for submitting their requests to the PBS contractor. As consortium members, both the local Spokane school district and the postsecondary education institutions share use of the cable channels, available from 8 a.m. to 10 p.m. weekdays and weekends. The school district coordinates the elementary and secondary educational programming during the daytime hours; CABLE, via its public broadcasting station contractor, schedules postsecondary programs for late afternoons and evenings. Using both cable and PBS facilities, courses can reach homes within a 12,000-square-mile area around Spokane, Washington. About 45 percent of households in the region subscribe to cable. Students view the video segments and study the print materials at home while having access to faculty members by telephone, mail, or in their on-campus offices.

## Enrollment

In the 1981-82 academic year there were 815 enrollments in consortium courses (recorded on the tenth day of classes). All courses for this year were offered by the community college consortium member. Retention varies by course, but typically ranges from 65 to 80 percent. Enrollment is up substantially for 1981-82 and has been growing steadily since the consortium was founded in 1977.

## Administrative Structure

In 1974, the FCC approved allocation of five educational access channels on the Cox Cable System of Spokane, though programming did not begin until 1977. The FCC would not permit one entity to operate the five channels. For this reason and in order to maximize cooperative exhibits in the areas of programming, financing, promotion, and technical development, the CABLE consortium was founded. Established by inter-local governmental agreement, the consortium includes the following members: Eastern Washington University, Washington State University, Community College District #17, Fort Wright College,

### Noteworthy Features

- has pioneered a consortium arrangement for the management of educational CABLE channel programming in a metropolitan area
- combines diverse public and private educational and community organizations in a cooperative venture

### Problems Encountered

- discouraging some consortium members from continuing to expect specific services from the consortium, since it was designed primarily to serve as a management structure for a variety of organizations and institutions interested in accessing the cable educational channels
- assessing complaints from some smaller consortium members who feel the larger members have an advantage with respect to programming access
- determing how the consortium will equitably treat a new consortium member

### Observations About Distance Learning

- many community residents continue to perceive telecourses as "talking heads"; more attention to public information programs about these courses is needed

### Future Plans

- develop two-way audio/video linkage among consortium facilities or campuses
- introduce live cable courses with a telepone call-in capability

### Contact Person

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CABLE Consortium
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Community College District #17
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Whitworth College, Gonzaga University, School District #81, the Catholic Diocese of Spokane, the Spokane Public Library, and Northern Idaho College. The city of Spokane manages the cable franchise and officially recognizes the CABLE consortium, a kind of governmental corporation, as the agency that facilitates programming and course scheduling for consortium members. The inter-local governmental agreement strategy was used as a means of incorporating eight state-supported organizations with non-state-supported organizations. The managing institution and technical headquarters for CABLE is station KSPS-TV, the public television station owned by School District #81 (Spokane Public Schools). The consortium employs no staff members; individual member institutions are responsible for course production and/or course purchase or leasing, but may informally elect to develop or purchase programs jointly. The consortium elects a chairperson and meets monthly.

### Finances

Grants solicited by School District #81 from the former Department of Health, Education and Welfare paid for early cable equipment purchases and microwave connections. The consortium budget for 1980-81 was about $26,500, all of which represented fees paid by the consortium members. Members are assessed payment on the basis of projected use of television facilities at about $7 per hour. Members, however, must pay a minimum fee of $700 whether or not they make use of 100 hours of air time. All funds collected are paid to Channel 7, owned by the local school district, and are used to compensate staff and to arrange for scheduling and playback functions associated with CABLE member programming (late afternoon and evening hours). The school district pays for daytime channel operation and maintenance. Each consortium member maintains its own budget for program leasing or program development, advertising, and faculty and staff salaries associated with these activities. New memberships in the consortium would cost about $40,000, approximately 10 percent of the worth of equipment used by Channel 7.

### Resources Available

A general description of the consortium; a copy of the inter-local governmental agreement; two videotapes available on loan or for a small fee that describe the consortium and how it was developed (one tape is designed for use by faculty, and the other provides a description of how the consortium operates).

# CALIFORNIA STATE UNIVERSITY, CHICO

## Telecommunications Program

Instructional Television for Students (ITFS)

### Educational Mission

Begun in 1975, Instructional Television for Students (ITFS) serves part-time, off-campus residents of 13 rural northeastern California counties (spanning 32,000 square miles) with upper-division credit courses. The program is designed to extend educational access to rural residents seeking to complete degree programs, update job-related skills, and meet new state licensure requirements associated with their professions. The average participant is in his or her mid-thirties. There is some evidence, but no specific data, to suggest that many ITFS students previously have taken on-campus courses at Chico State and/or are enrolled concurrently in courses at a local community college.

### Telecommunications Technologies

The Instructional Television for Students (ITSF) program at Chico uses a technology with the same acronym. It is Instructional Television Fixed Service (also known as ITFS). The ITFS technology is a closed circuit broadcast television system which makes possible one-way video/two audio, transmission to sites equipped with the appropriate antenna and audio return equipment. Either commercial telephone lines or radio communication (audio talkback) are used to provide audio communication between the various off-campus classroom sites and the Chico campus. A special "brown box" (or cross-frequency converter) that allows for closed-circuit viewing of ITFS courses at home can be borrowed from the university by subscribers to several local cable television services. Each site has direct-dial phone communication through the system to campus offices (i.e., advising, library reference, admissions, etc.).

### Curriculum

Most of the 80-plus courses offered since 1975 are in the liberal arts, all at the upper-division level. Participants can complete major course requirements for the B.A. degree in social sciences and minors in family relations and community services. The number of courses offered has been increasing annually. In 1979-80, 28 courses were offered. On- and off-campus learners use the same course materials and take the same examinations. University of California-Davis and Chico State are linked with closed-circuit television to provide worksite computer science courses to employees of Hewlitt-Packard and Grassvalley Group Electronics.

### Faculty Roles

The dean of continuing education and his staff work with other deans and department heads to select courses for off-campus viewing. Currently, more courses are requested for broadcast than can be scheduled. Priority, therefore, is given to courses that meet degree-program requirements.

An orientation program is provided for faculty before each new school year to give them experience with studio classroom microphones and overhead cameras. For the first two weeks of an ITFS course taught by a faculty member new to the system, media staff sit with the faculty member in the special classroom and make suggestions about how to use the equipment. Faculty interact with the off-campus students via the two-way audio hook-up and are available for telephone office hours. The coordinator of the social science B.A. program maintains extensive telephone contact with advisees. In spring 1981, ITFS students were invited for a special on-campus day to meet each other and university faculty and staff.

ITFS course enrollments are treated the same way as on-campus enrollments, with funds allocated to instructional departments on FTE enrollment basis. This funding mechanism, along with the time savings realized by lessened faculty travel to off-campus sites, has provided strong incentive for departments to request inclusion of courses in the ITFS program.

### Delivery System

Development and operation of an off-campus learning center structure is considered a critical component of the program. When fully developed, the centers are to provide all the functions of the university (library, instruction, student services, administrative

**Noteworthy Features**

- offers interactive (two-way audio, one-way video) instruction at the undergraduate level to a rural population
- supports 13 rural learning centers with extensive student, administrative, and instructional services
- integrates library services into a delivery system serving a large rural area
- minimizes technical aspects of the system, thus promoting ready operation by faculty members
- can expand off-campus facilities to meet demand for courses (on-campus facilities are subject to enrollment ceilings)
- operates a telecommunications program that is considered a regular part of the campus program, not a "special appendage" of the university

**Problems Encountered**

- identifying the most efficient and effective way to distribute course materials to the off-campus students
- developing adequate library services for students at off-campus learning centers
- managing the increasingly competitive demands placed on the one on-campus studio classroom
- maintaining the quality of the technical equipment
- developing the faculty's television communication techniques for teaching

**Observations About Distance Learning**

- Off-campus learners usually are willing to put up with periodic, minor technical problems because they are grateful for the opportunity to have access to the class.
- High quality teaching is as good on air as off air, suggesting that the quality of instruction can be maintained with the introduction of an ITFS system.

**Future Plans**

- increase the number of learning center sites to 15

- strengthen library support and computer access at off-campus sites
- expand the number of program majors and minors that can be completed via television only (a minor in psychology, a major in business, and a major in computer science)
- improve the comprehensive function of learning centers by implementing a series of recommendations proposed in a key paper on "learning centers" (including the hiring of new personnel and the expansion of a series of learning centers differing in degree of service comprehensiveness)

## Contact Person

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services) to the off-campus student, ensuring that his or her learning experience is equivalent to that of the on-campus student.

One on-campus special studio classroom is used to broadcast courses from 8 a.m. to 10 p.m. Monday through Friday, and Saturday from 9 a.m. to noon to 13 off-campus public learning centers and to 2 worksites (Grassvalley Group Electronics and Hewlett-Packard). The on-campus studio can accommodate 30 students and contains three TV monitors and a microphone for every two students.

Sites used as learning centers include a city hall, several high schools, a county schools office, a community college library, and the education center of an Air Force base. For the first two weeks of the class, monitors are assigned to the off-campus sites to register students and instruct them in how to activate and utilize the technical equipment. The students are then on their own, though examinations are proctored. Local library facilities and staff constitute key support sources to the students. Students viewing a course over cable at home must travel to a learning center or to the campus for examinations. A reference librarian at the university library is assigned to coordinate outreach of library services.

## Enrollment

Enrollment for the 1981-82 academic year was approximately 850 as of the fourth week of classes. Accurate retention figures are not available at this time; however, there is very little drop-out. Enrollments have increased steadily since 1975 when the program became fully operational.

## Administrative Structure

The dean of continuing education works closely with other deans to develop the ITFS course schedule. The media center's Instructional Development Office is used to train students and teachers in the use of the system. The coordinator of television in the media center is responsible for technical operations. The ITFS program is considered an integral part of the university program and not a separate continuing education program. All relevant on-campus offices (library, advising, admissions) are expected to meet the needs of ITFS participants as part of their regular duties. Each Friday, staff of continuing education, the director of the media center, the coordinator for instructional development, staff from the advising office, a campus librarian, and, periodically, admissions personnel, meet to review and discuss ways to further improve the program. A number of new staff appointments have been recommended, including a full-time coordinator for the off-campus program, a permanent extended campus librarian, and full-time off-campus personnel to staff the regional learning centers.

## Finances

No separate budget is maintained for the off-campus program. Admitted ITFS students are assessed the same fees as on-campus students, and the university receives the same kind of state funding support for off-campus enrollments as for on-campus enrollments. A special fee is assessed students enrolling under the Resident Extension Program. At the learning centers, only custodial fees are reimbursed by the university; the balance of the local expenses (for building maintenance, utilities, etc.) are contributed by each participating site as a community service. Major program expenses include equipment, student operators for the ITFS origination classroom, and on-site monitors.

## Resources Available

A brochure, "Instructional Television for Students"; a key staff paper outlining a plan for developing the learning centers; an historical summary of ITFS courses and enrollments by Charles Urbanowicz, "ITFS (Closed-Circuit Television)
Statistical History and Status Report to Date," November 9, 1979; a brief paper describing the on-campus Learning Activities Resource Center; and a memorandum from the Subcommittee on Staffing to the Learning Center Group (11/15/79) describing the role of the library in off-campus programs.

# CATHOLIC TELEVISION NETWORK (CTN), BAY AREA DIOCESES

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## Telecommunications Program

Senior University of the Bay Area

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### Educational Mission

Senior Univeristy is an educational outreach program offering instruction and information to senior citizens at group sites throughout the San Francisco Bay Area. The 15 learning sites include senior citizen centers and residence facilities as well as many Catholic parishes in the Bay Area. The older adult participants vary in age from 56 to 83, with the average being approximately 69. The majority (70 percent) are female.

### Telecommunications Technologies

The Catholic Television Network is a four-channel microwave television station that provides programming over an established Instructional Televison Fixed Service (ITFS) system. Telephones at group viewing sites make possible a teleconferencing format in which students are able to interact with their instructors in the studio. Senior University uses a fully automated, three-color camera production studio, which can be operated by one production engineer. This arrangement allows the staff to produce programming very inexpensively.

### Curriculum

Unlike most approaches to distance learning, which focus primarily upon the individual learner studying independently in a home environment, Senior Univeristy serves older adults at existing group sites. The program seeks to build upon and enrich existing social networks. Senior University courses focus primarily upon the humanities and practical knowledge (coping skills). Humanities courses include literature (short stories), history of art and photography, the history of the 1930s, and the history of San Francisco. Practical knowledge programming has included home and personal safety, yoga, music, and current events. General information on local, state, and national topics of interest to older adults also is included in the programming. Senior University courses use a combination of existing film and video programming, plus an on-camera instructor. This is much less expensive than all-original productions would be.

### Faculty Roles

Senior University staff select faculty from area colleges to assist in the design of the video and print components of the course. Working on a contract basis, the content expert outlines the course contents and writes the first draft of the printed support materials. Senior University staff have responsibilty for making the course design work in the studio and for locating existing films (when possible) that correlate with the package of print materials. In the final editing of the course materials, both faculty and staff are careful to encourage the discussions that occur at the group sites following each program and during the two teleconferences included in each course.

The faculty person who assists in the course development also serves as the television studio teacher or "host." He or she introduces the subject matter and any special content expert, invites the students to watch the 30-minute film, then interviews the topic expert and/or provides a summary analysis of the topic. During the two teleconference sessions included with each course, the faculty host leads a discussion in which older adults from all the sites can participate.

### Delivery System

Since the Senior University is not offering credit courses and since the older adults observe the television programming at group viewing sites, there is less need for many of the support services that customarily accompany a distance-learning delivery system. However, at each of the 17 group viewing sites a volunteer coordinator (or host) facilitates the learning process by welcoming the participants on behalf of Senior University, distributing class materials, and leading the discussion that follows the one-hour television broadcast. The coordinator, who is usally a staff member or informal leader of the viewing-site organization, also handles the local logistics during the two class sessions of each course that are conducted as a live teleconference. Coordinators do not bear the burden of fulfilling a traditional teacher role, and this seems to

### Noteworthy Features

- delivers educational programming to older adults at group viewing sites located in existing organizations
- makes live interaction among learners and faculty possible through teleconferencing
- mixes academic and practical course subjects that appeal to older adults
- affords low-cost course production by integrating existing film materials with in-studio content experts
- affords low-cost video production by using a three-camera automated studio, which can be managed by one engineering technician
- previews short (three class session) courses in order to test new topics and obtain feedback from older adults before going into full course production
- has stimulated sufficient interest in the program so that two viewing-site organizations created their own courses by selecting videotapes from the CTN library and organizing their own discussions

### Problems Encountered

- evolving a role for the viewing-site coordinator (was originally envisioned as that of a relatively active peer teacher, but problems with older adult response to the coordinator as well as program management considerations led to the current reliance on informal group leaders serving in a low-key "host" role)
- overcoming low older adult attendance at group program viewings at the first three sites
- learning how to distribute most effectively the time of a small staff to meet the numerous demands of working with faculty members, selecting existing video materials, preparing extensive print materials, and managing group sites

### Observations About Distance Learning

- older adults prefer substantive,

in-depth, course content material to overviews and surveys
- older adults prefer the security of a very specifically structured course design
- older adults seem to prefer courses that enable them to draw upon their life experience and personal/family memories (e.g., history, literature)
- older adults like to share their experiences and feelings, but not too deeply or personally
- written support materials are appreciated most by older adult learners if they are relatively short, well-structured, and, most important, typed in large print
- older adults who serve as learning-site facilitators are crucial to the success of an educational effort involving their peers
- discussion guidelines for facilitators work best when they suggest several alternative approaches from which to choose
- a regular, comfortable meeting place is important in maintaining older adult attendance at group-learning sites
- most older adults have a difficult time viewing themselves as resource persons in a learning environment

### Future Plans

- expand the number of courses and viewing sites
- make courses available to educators in other communities
- combine resources with other community agencies in the Bay Area that are concerned about older adults

### Contact Person

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contribute to a more relaxed and informal atmosphere that senior citizens appreciate. Senior University staff contact the site coordinators at least once a week to obtain feedback on the seniors' responses to the courses. The package of print materials that accompanies each course and is available to each older adult student contains background information, readings, and discussion questions.

## Enrollment

Since its inception, the program has had approximately 170 enrollees. In 1979-80 there were 40 enrolled, and in 1980-81 there were 95.

## Administrative Structure

The Senior University is sponsored by the Catholic Television Network, which is a communication vehicle of the Bay Area dioceses. CTN provides instructional and administrative support to Catholic elementary and secondary schools, public and private hospitals, church parishes, and other community service agencies in the Bay Area. Senior University has a 40-percent-time project director, a half-time secretary, and two staff (one-and-a-half equivalent) who concentrate on course production and the development and coordination of learning sites.

## Finances

The Senior University has been supprted by a three-year grant from the Fund for the Improvement of Postsecondary Education (1978-79, $120,660; 1979-80, $182,000; and 1980-81, $103,000). The Catholic Television Network continues to operate the Senior University beyond the grant period by assuming a larger share of the program's expenses and by charging participating senior citizen organizations and parishes a yearly fee of approximately $420. By increasing the number of sites served from three in the first year to twenty in the fourth year, Senior University staff have improved the program's likelihood of financial success. Major expenses include staff and faculty salaries and course production. Senior University is able to produce all the video and print materials for an eight-week (one-hour class session) course for approximately $17,000.

## Resources Available

First, second, and final year program evaluations conducted for the Fund for the Improvement of Postsecondary Education, course descriptions and schedules, brochures for individual courses, any courses developed entirely with CTN video and print materials.

# CENTRAL MISSOURI STATE UNIVERSITY (CMSU)

## Telecommunications Program

KCMW-FM Instructional Program

### Educational Mission

KCMW-FM, at one time the fourth largest producer of instructional radio programming in the country (between 1973-81), has suspended its instructional radio offering because of severe financial constraints facing the university. KCMW-FM instructional radio offered a variety of undergraduate liberal arts courses that were primarily intended for off-campus learners, but since promotion efforts were limited to the campus, many more on-campus than off-campus students took the radio courses. KCMW-FM has also offered its own adult basic education radio courses in cooperation with a local school district. Off-campus students were generally 10 years older than on-campus students.

### Telecommunications Technologies

Programs were broadcast by the university's radio station (WCMW-FM) with replays of programs available on audio cassette at the radio station, the library, and other convenient locations. Student-faculty interaction was facilitated by a statewide toll-free telephone number.

### Curriculum

KCMW-FM has broadcast a broad range of courses in music appreciation, literature, German language, business and finance, and government and social studies. The instructional program started with one course the first year of its operation, and at its peak KCMW-FM was producing about three to four courses a year. Without counting course revisions and remakes, which were required every one to two years, KCMW-FM produced nine college level and five adult basic education courses. In addition, the station broadcast seven courses produced by other organizations including National Public Radio.

Each of the liberal arts course segments was designed in a public information format to increase its usefulness for radio listeners who tuned in irregularly or accidentally.

### Faculty Roles

Faculty members exercised complete control over course content, and all radio courses underwent the same approval procedure as other CMSU courses. Some courses adapted easily to the radio format, and others required major restructuring. In addition to their course development activities, faculty were required to meet or have phone contact with all students enrolled for credit at least twice during the semester.

### Delivery System

During peak programming periods, KCMW-FM college-level courses were broadcast three mornings and three afternoon hours each weekday. Students and faculty were able to communicate in person on campus or via a statewide toll-free telephone as well as on campus during midterm and final exams.

Approximately 95 percent of those who enrolled in courses that were required for graduation (e.g., World or American History) were on-campus students, and the ratio was almost reversed for courses like German language and personal finance, where almost all enrollees were off-campus students. In most cases, radio courses were coordinated with commercial textbook assignments and designed as complete courses, but in some instances broadcast programs were intended only as supplements to on-campus courses.

### Enrollment

Enrollment in any single course ranged from 5 students to 50, with the peak total enrollment of approximately 200 in 1976-77 and an average enrollment of approximately 100 per year. The completion rate for all courses was approximately 90 percent.

### Administrative Structure

Instructional Radio was one component of the program offering of KCMW-FM. KCMW-FM, a campus radio station, is part of the public relations division of the university, which, in turn, is under the vice-president for institutional advancement. During peak operation, the program employed a full-time producer.

### Noteworthy Features

- was one of the largest producers of instructional radio in the country
- broadcast radio courses on a main carrier FM station rather than on a subcarrier
- used a public information format approach to course design in order to make each individual program segment attractive to nonstudent listeners as well as to students

### Problems Encountered

- overcoming the liability of too little money for off-campus promotion of radio courses
- dealing with faculty complaints about financial compensation for large and small classes
- surviving in the face of changing university priorities and severe cuts in the states' education budget

### Observations About Distance Learning

- off-campus promotion is essential if a program is to reach many learners beyond the campus
- evening hours, arranged as much as possible to avoid special programming (presidential news conferences, sports events, etc.), seem to be the preferred time for adult learners
- students prefer a midterm exam as a way to check their progress
- off-campus students generally have better completion rates and higher grade point averages than on-campus students

### Future Plans

- none at this time

### Contact Person

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## Finances

With the exception of grants for certain special projects conducted with a local school district, the KCMW-FM instructional program was financed entirely out of the general operating budget of the radio station. Tuition fees related to radio instruction went into the general university fund, not directly to the radio station. Budget figures are not available but the program clearly was not self-supporting. KCMW-FM had to absorb a 25 percent budget cut in 1980-81, which accounts for the current status of the radio courses.

## Resources Available

A list of courses is available

# CENTRAL PIEDMONT COMMUNITY COLLEGE (CPCC)

## Educational Mission

Central Piedmont Community College provides credit and noncredit liberal arts and occupational as well as extension and personal enrichment courses to the people of Mechlenburg County (Charlotte), North Carolina (a population of over half a million). The college serves over 55,000 individuals at over 200 learning sites each year.

Unlike many colleges that use telecommunications technologies to serve clientele, CPCC does not assign responsibility for such activities to a separate unit labeled "open college," "college of the air," or "instructional telecommunications program." The college has for many years continued to integrate the use of various communications technologies into all its academic departments until, today, it is possible to say that, in any given term, approximately half the courses offered can involve one of these technologies if faculty members so choose.

Although CPCC's highly integrated approach to the use of telecommunications may make its activities more difficult to describe, it does have advantages for the college. The decision to allow the use of these technologies to evolve in such a decentralized manner was consciously made, in part, to avoid the extent of faculty resistance CPCC staff witnessed at other colleges that did create a separate organizational unit for telecommunications-related programming. CPCC's approach also makes it easier to incrementally increase or decrease telecommunications activities without major financial and organizational disruptions.

In some cases telecommunications technologies are employed to provide flexibility for learners taking courses on campus and, in other situations, they are used to support courses aimed specifically at those who learn at home and need to minimize trips to campus. The average age of CPCC students is approximately 30. Although sex ratios vary greatly from course to course, about 65 to 70 percent of CPCC students are female. In addition, CPCC makes special efforts to serve print-handicapped students.

## Telecommunications Technologies

Central Piedmont Community College uses open-broadcast (public) television, cable television, SCA radio, videotapes, audiotapes, telephone-accessed audio cassettes, and regular telephones to serve its students. Telephone-accessed audio cassette systems enable a student to use the telephone to listen to audiotapes containing educational information. The machine that makes this telephone access to the audiotape possible is called a "telecassette." It is similar to a telephone answering device except that it records the number of times the audio cassette has been accessed and its educational message may take up the entire cassette.

## Curriculum

Since telecommunications technologies are used in as many as half the courses at CPCC, students taking liberal arts, (e.g., government, sociology) occupational (e.g., data processing, automotive) and personal enrichment (e.g., home repair) courses are all likely to use one or more of the technologies. Television is used in basically two different course formats, the telecourse and the video module.

Each quarter approximately 12 television courses, or telecourses, containing 30 half-hour video segments are offered at CPCC. Of these, half are leased from national course producers (distributed by ASCN, PBS, or the producer) and the other half are produced either by CPCC alone or in conjunction with the ACCESS Consortium to which the college belongs. ACCESS is a course-producing consortium that includes Coastline Community College (California), Lane Community College (Oregon), City Colleges of Chicago, Metro Community College (Missouri), and CPCC. All these telecourses include study guides and textbooks as well as the video segments. These courses are clearly designed to serve the off-campus learner.

As many as 150 different CPCC courses have video modules, varying in length from 10 to 30 minutes, which faculty can choose to use in class or assign for viewing in campus learning centers or off-campus learning support centers. Such modules may not be as convenient as telecourses for learners who prefer to learn at home, but they do increase the flexibility of courses offered on campus and at the numerous off-campus

### Noteworthy Features

- decentralizes to the academic departments financial and curricular decisions regarding the use of telecommunications technologies rather than assigning responsibility to a separate administrative unit
- treats electronic media the same as any other of the pedagogical approaches available to faculty
- uses over 200 learning sites in community facilities to provide convenient classroom facilities for students throughout the county; the availability of these conveniently located class sites serves to blur conventional distinctions between on campus and distance learners
- decentralizes audio and video resources as well as other student support services (registration, counseling, information) into three off campus learning-support centers
- uses telephone-accessed audio cassettes to add flexibility for students by reducing the amount of course content delivered in class; the same technology is used to provide extensive public service educational information over the DOLLY system
- integrates audio or video modules (varying in length from 10 to 30 minutes) into over 150 different courses
- offers a GED preparation course and a reading service to print-handicapped students over SCA radio

### Problems Encountered

- devising an organizational approach to using telecommunications technologies that minimizes faculty resistance; CPCC's decentralized approach has largely solved this problem
- anticipating any changes in state funding formulas related to telecourse students
- describing to others how highly integrated telecommunications technologies are in the operations of the college

learning sites.

Telephone-accessed audio cassettes were initially used at CPCC on an experimental basis. Five faculty from different departments each selected one course for which they prepared audiotapes representing a minimum of 10 percent of total class presentation time. (This usually amounts to more than 10 percent of the course content because faculty presentations prepared for taping are generally more concise than class lectures). Students could then reduce their in-class time (either on campus or at a remote learning site) by calling the faculty member's telephone number during evenings, nights, or weekends and accessing the tape(s). Each student in the initial experiment was issued a telephone-amplifying system with a small speaker to permit taking notes or working on problems. In view of the success of this experiment, CPCC has continued the practice at approximately the same level of activity.

The DOLLY System (Dial Our Learning Listening Library) is another way CPCC makes educational programming available to credit and noncredit students. This telephone-accessed audio cassette service is available on a 24-hour-a-day basis and offers taped audio messages from 1 to 15 minutes in length on approximately 600 different topics in categories such as physical health, mental health, consumer information, learning by phone, social issues and problems, information about CPCC and entertainment. Although many of these tapes can be required by faculty as course assignments, they are primarily a noncredit, personal enrichment activity that the college offers as a public service to the community. Nevertheless, they do constitute easily accessible and substantial learning resources for students and nonstudents alike. The DOLLY system, which receives approximately 400,000 telephone calls per year, is accessed by calling an operator during the daytime and requesting any tape in the catalog. At night and weekends a limited number of DOLLY tapes (the selection changes weekly) can be accessed by dialing specific telephone numbers advertised in the newspaper. Each telephone number corresponds to an audiotape that is on a telecassette player.

## Faculty Roles

One of the reasons there is no separate organizational unit responsible for telecommunications programming at CPCC is because each academic department makes its own decisions about whether or not to use any of its departmental resources on such instructional methods. This arrangement ensures that CPCC offers only telecommunications courses that its faculty feel are financially, as well as academically, justified. The content of the telephone-access audio cassettes is entirely determined by the faculty teaching the courses. Telecourses produced by CPCC or in cooperation with other institutions (e.g., the ACCESS Consortium) involve faculty as course writers and in course committees that work with video production staff. The faculty must approve the course plans package before it goes into the production phase. Telecourses leased from other producers also must be approved by faculty.

## Delivery System

In addition to classroom, library, and learning center resources on campus, CPCC maintains three learning-support centers in the county equipped with audio and video materials to assist students who need to review telecourse segments or course modules (classes are rarely held in these three support centers). The numerous CPCC courses that are available off campus are offered at over 200 classroom sites around the country. Sites include industries, churches, libraries, and fire stations; most sites are available to the college at no charge or for minimal maintenance fees. Faculty travel to these sites to offer their courses. With such a large number of learning sites available, distinctions between learning in the college classroom and learning at a distance become less relevant than at most colleges.

In addition to going to any of the three learning-support centers to review videotapes, telecourse students can communicate with their faculty during compulsory orientation meetings, optional class meetings, by telephone, through the mail, or in person. Video segments or telecourses are available on the local public broadcasting station and cable channel.

CPCC provides a reading service for visually handicapped students over SCA (a subcarrier communications authority) radio. A GED preparation program that also is carried over SCA radio primarily serves the same print-handicapped adults who have SCA receivers.

## Enrollment

The telecourses offered by CPCC attract approximately 950 enrollments per year. The completion rate for these courses is approximately the same as traditionally taught courses. Enrollment at CPCC is recorded a fifth of the way through the quarter. Enrollment figures on courses using audio and video modules are not maintained separately.

## Administrative Structure

Telecommunications activities are so highly integrated into the day-to-day activities of CPCC that no identifiable administrative unit exists. Each academic department is free to spend part of its funds on developing or leasing video or audio materials to supplement existing courses. The vice president for Educational Planning, who has a long-term acquaintance with the use of telecommunications technologies, has general responsibility for providing support services related to telecommunications activities at CPCC.

## Finances

No separate budget categories are maintained for media activities at CPCC.

## Resources Available

Program listing, report of telecommunications demonstration project. Information about telecourses produced by the ACCESS Consortium can be obtained from Dr. Norman Watson, President, ACCESS Consortium, Coast Community Colleges, 1370 Adams Avenue, Costa Mesa, California 92626.

### Observations About Distance Learning

- there seem to be few noticeable differences between on campus and distance learners
- most students prefer coming to the off campus learning sites rather than to the campus
- one way to overcome faculty resistance to telecommunications technologies is to place the decisions regarding their use in the hands of the academic departments
- students do make use of support services (e.g., videotape viewing) when the college decentralizes them in numerous learning-support centers around the county

### Future Plans

- offer Appalachian Community Service Network programming to students over local cable television channels
- acquire satellite earth stations for the three learning-support centers
- offer academic courses over radio to distance learners

### Contact Person

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# CITY-WIDE COLLEGE OF THE CITY COLLEGES OF CHICAGO

### Noteworthy Features

- serves the entire Chicago City College system
- enjoys close working relationship with public library system (videotapes and teacher/counselors are available to students at certain public libraries)
- offers television, radio, and video cassette course options to learners
- experiments with combining radio and television segments for the same course
- uses radio as a student-support vehicle for television-based courses
- serves a very large population of GED candidates through a television course offered in cooperation with the public library system
- offers ESL course over television to the Spanish-speaking population
- has been offering credit courses by television for 25 years through its TV College program

### Problems Encountered

- paying the high cost of broadcast time in a major metropolitan market
- conducting so much learning activity via the mail when labor costs are high and maintaining accurate, up-to-date addresses is difficult
- informing potential students of available educational services
- obtaining sufficient Spanish-learning educational programming
- planning long-range schedules when PBS and commercial television schedules operate on short time limits

### Observations About Distance Learning

- the composition of TV College's clientele has changed from primarily middle and upper-income, suburban, white females in the 1950s and 1960s to a mix that more closely reflects the minority, urban population of Chicago
- radio can be effectively used as

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## Telecommunications Program

Center for Open Learning (COL)

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### Educational Mission

The Center for Open Learning provides a range of educational services to students with special needs not readily met by traditional programs. In addition to TV College, Radio College, and Study Unlimited, the center offers GED preparation and English as a Second Language (ESL) training as well as testing and assessment services. TV College, Radio College, and Study Unlimited offer video- and audio-based courses via broadcast and cassettes.

Most students are working adults with an average age of 29 to 30. The student population is, as a whole, representative of the Chicago metropolitan area population. The largest proportion of students are black women, although there are also many Hispanic and Anglo male and female students. Approximately two-thirds of the students are concurrently enrolled in one or more on-campus course; most take only one TV College, Radio College, or Study Unlimited course at a time.

The center makes special provisions for military, homebound and handicapped, and incarcerated students.

### Telecommunications Technologies

The center uses public and commercial broadcast television and radio, video and audio cassettes, and the telephone to serve its students.

### Curriculum

Each semester TV College, Radio College, and Study Unlimited offer approximately six television, five radio, and fifteen video and audio cassette courses, respectively. TV College and Radio College broadcast their programming over public and commercial stations, and Study Unlimited makes video and audio cassettes available to students at designated public libraries and on-campus locations. Participation in any or all of the three programs is based on student preference and convenience.

Most courses are of an introductory liberal-arts nature, with business-related courses constituting an increasing proportion of the curricular offering. Even though Chicago TV College has produced over 100 courses during its 25-year history, only an occasional television course is currently produced using only local resources. The Center for Open Learning shares in the co-production of television courses (telecourses) with Coastline Community College, Dallas County Community College District, Miami-Dade Community College District, and the Maryland Center for Public Broadcasting. Over half the radio courses are produced by the center; the rest are acquired from other institutions or agencies. Print materials for all courses produced by the center are developed by City College faculty.

In addition to these college-level courses, the center offers a GED preparation course by television and video tape. The video and print materials are based primarily on courses developed in New York State and in Kentucky. *English as a Second Language* is offered as a credit or noncredit course over a predominately Spanish-language television station. The course was developed by Puerto Rico Junior College.

### Faculty Roles

City College faculty are centrally involved, on a release-time basis, in the development and production of television and radio courses produced by the center. They are less involved in the development of courses that are co-produced with other colleges and not at all involved in the development of courses acquired from national distributors. In all cases, however, faculty are centrally involved in the course selection process.

Each course offered by the center has at least one faculty coordinator responsible for supporting students by way of optional class meetings, telephone and face-to-face consultations, and various forms of written feedback and information. Depending on faculty members' course loads, they may be responsible for a course offered simultaneously through TV College and Study Unlimited. Faculty involvement in center courses is treated as part of their regular City College teaching load.

## Delivery System

Students taking TV College and Radio College courses have, in addition to required exams, the opportunity to attend at least three optional group conferences at which faculty discuss the course content conveyed in the video (or audio) and print components. In some cases these conferences take the form of field trips to such locations as museums and planetariums. During scheduled office hours faculty are available for telephone and face-to-face consultation with students. Students also receive information and feedback on their progress through the mail.

Study Unlimited students can go to any of eight public library and two City College sites to view videotapes. Counselors, hired by the center, are available at least 30 hours per week at each of these Study Unlimited sites to assist students. In addition, students may contact, by phone or in person, the faculty members responsible for specific courses as well as the coordinator of the Study Unlimited program. Study Unlimited students are able to complete course requirements as much as six months after the close of the semester.

The center staff use radio to support all their courses. Faculty coordinators have the opportunity to discuss pertinent information about their courses on radio programs at the beginning and near the end of the semester. Students can also turn to their radios for a weekly half-hour program, sponsored by the center, called "Open Learning in Perspective."

Faculty make special visits to students at the Army's Fort Sheridan and to students at prisons and jails in the Chicago Metropolitan area. One faculty member is even assigned to visit homebound and handicapped students in their homes. GED students can get assistance from teacher/counselors on campus or in many public libraries and can see the video component of their courses on television or on videotape in the public libraries.

## Enrollment

Since 1956, TV College alone has had over 131,000 enrollments. Currently TV College, Radio College, and Study Unlimited together average approximately 1,350 students per semester. The completion rate in these credit courses varies from 40-60 percent, depending on the individual course. Enrollment in the GED program is approximately 1,500 per semester (4,500 per year). Data on GED test completion following the course are not readily available. Like many telecommunicatons programs, the Center for Open Learning experiences wide, unexplained fluctuations in enrollment from year to year.

## Administrative Structure

The Center for Open Learning is part of Chicago City-Wide College, which provides a variety of services to students throughout the City Colleges of Chicago system. It is not limited to one community college or region within the metropolitan area. The center's staff, which numbers approximately 22 full-time persons, is responsible for a number of other programs besides TV College, Radio College, and Study Unlimited (see Educational Mission).

## Finances

Major expenses for the center include broadcast time in a major metropolitan market, faculty and staff salaries, course acquisition, reproducing tapes, printing course materials, promotion, and course production. Major sources of support include student tuition, state funding based on enrollment, and state grants for serving disadvantaged students. The overall budget for the Center for Open Learning is approximately $950,000 per year.

## Resources Available

Study guides for radio courses, course materials, program schedules.

Television Courses: Office Procedures and Human Growth and Development

Radio Courses: Geography of Chicago, U.S. Labor History, Introduction to Music and Perspectives in Jazz

COL has also co-produced television courses in child development, geography, health, arts, mathematics, philosophy, business, government and psychology.

part of the student-support system for television courses

## Future Plans

- find or develop a GED series for radio
- expand Study Unlimited into industrial sites
- offer an AA degree by combining electronic media-based courses with portfolio assessment, credit for prior learning, and print-based, self-paced, courses
- offer a Spanish-language GED television course and other bilingual programming
- have its own broadcast television channel as of January 1983
- offer services of a comprehensive community college via radio

## Contact Person

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# COASTLINE COMMUNITY COLLEGE OF THE COAST COMMUNITY COLLEGE DISTRICT

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### Telecommunications Program

Coordinated Instructional System (CIS) Support

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### Educational Mission

The Coordinated Instructional Systems Support Program offers flexible and convenient learning options within the institutional context of one of the most accessible colleges in the county—Coastline Community College. Coastline is a "college within the community" and has no campus of its own; rather, it makes uses of numerous libraries and community learning centers to deliver classroom instruction and to support individualized instruction. The Coordinated Instructional Systems Support Program is the delivery system for individualized instruction options that include broadcast television courses, nonbroadcast video courses, radio courses, text/audio courses, and newspaper courses.

Most CIS students are adults employed full- or part-time who, because of learning-style preferences and/or time constraints, are sufficiently motivated to learn on their own with support from CIS faculty and staff. Their average age is between 35 and 40, approximately 65 percent are female, 75 percent already have between one to thirty college credits, and 47 percent are enrolled concurrently in classroom courses at Coastline or at other colleges. The socioeconomic and ethnic mix is, like the community it serves, primarily middle- to upper-income and white. CIS staff also serve special populations such as military, handicapped, and incarcerated students.

### Telecommunications Technologies

Coastline Community College uses public and commercial broadcast television, cable television, public radio, video and audio cassettes, the telephone, and the computer to serve students.

### Curriculum

Individualized study options at Coastline Community College are primarily introductory-level liberal arts core and elective courses. The number of courses in each instructional mode varies from semester to semester. For example, in the spring 1981 semester students could choose from among:

16 broadcast television courses (telecourses)
3 nonbroadcast television courses
1 radio course
5 text-audio courses
1 newspaper course

The number of broadcast television courses offered in a semester has been as high as 20. Since Coastline and the district's PBS-affiliated broadcast station KOCE-TV are the largest producers of nationally marketed telecourses, many of these television courses are produced locally or in cooperation with one or more other institutions. The remaining courses are leased from other telecourse producers, such as Miami-Dade Community College, the Dallas County Community College District, and the Maryland Center for Public Broadcasting.

The overall course development process is managed by a design team selected by the Office of Telecourse Design and composed of specialists in instruction, television, print, promotion, and marketing. The design team identifies and hires a team of nationally-known content specialists on a contract basis to determine the course learning objectives and to organize them into major units. A second team of local/regional academic specialists then allocates the objectives across a 30-program format. After decisions are made about what constitutes the best use of video and print for each program, a search for and an evaluation of existing visual and print resources is conducted. Based on a comparison of available commercial textbooks and the course objectives, a textbook for the course is selected. The development of new print materials, such as student study guides and faculty manuals, follows the complex process of producing new video material. A separate validation team is charged with the responsibility of ensuring that the final products convey their academic content accurately.

Just as video components vary in their use of instructional hosts, on-camera experts, and new and existing film footage, the time period for producing an entire course can vary between one and a half and two and a half years. The course development process for radio and text audio courses is similar, though less complex.

## Faculty Roles

Coastline Community College employs approximately 30 full-time and 800 part-time faculty for all of its programs. In its individualized instruction courses, CIS employs 5 full-time and 28 part-time faculty to serve as course managers. Although some of these instructors will have been involved in the development of courses, most will not.

The part-time faculty are hired based on the combination of related academic background and world-of-work experience they bring to the subject matter of the course. Those who are full-time instructors at one of the three Coast Community College District campuses are paid for five hours per week for up to 350 students, plus one hour for each additional 70 students. Individual instructors are allowed a maximum of 630 students (nine hours' pay). If two or more faculty teach the same course, each receives an additional hour's pay to compensate for coordination between them. Courses like English, which require extensive faculty feedback on written assignments in addition to the normal load of telephone contacts with students, are treated somewhat differently.

In addition to conducting personal student conferences and initiating and receiving student phone calls, the course manager is responsible for developing, revising, or compiling a test bank of 200 to 300 objective questions for midterm and final exams as well as for 6 to 8 quizzes. Occasionally faculty will hold one or more optional class meetings or conduct a field trip in addition to administering the required midterm and final exams. Each faculty member sends out an orientation letter to his or her students describing the substance and logistics of the course and maintains written contact via periodic mailings during the semester.

## Delivery System

Since Coastline is a college "in the community" rather than on a campus, the facilities used to support individualized study include the libraries and learning centers at Golden West and Orange Coast Community Colleges, four public libraries, five learning centers, high school cafeterias, and an Elks' hall. Videotapes and audiotapes are available for student review at all six library/learning centers, optional classes and examination review sessions occur at learning centers or Coastline's administrative offices, and midterm and final exams take place in large facilities like high school cafeterias and the Elks' hall.

Of course, most of the learning takes place in the students' homes where they can watch each video component of the telecourses at two or more scheduled times during the week. In addition to two half-hour video components, students have a textbook and study guide that accompany each course. Students taking radio or text/audio courses can purchase or duplicate audiotapes for use at home as well as listen to them at the six library/learning centers. Tapes for radio courses also can be accessed by phoning a special number, which activates an audio cassette playback unit at any time of the day or night.

The staff of the Coordinated Instructional Systems Support Program supervises learning managers and provides centralized control over a wide range of student support services. CIS maintains office space and telephones with an automatic answering service so that students can call their learning manager during regularly scheduled office hours or leave a message at any time. Among the support services handled centrally by CIS are scheduling and arranging for examinations and for seminar and review session facilities; printing exams, quizzes, letters, newsletters, and other written communications between learning managers and students; processing mail communications between learning managers and students; managing the computerized student feedback materials; and developing, conducting, and analyzing student course evaluations. The computerized feedback system not only provides students with their examination or quiz scores, but also prescribes specific portions of the print or video material where a particular topic was discussed. CIS students are able to register for courses by mail or telephone.

### Noteworthy Features

- serves more learners via prerecorded telecommunications courses than any other single institution in the United States
- produces more telecourses than any other single education institution in the United States
- leases or sells more of its telecourses to other colleges and universities (over 700 in 1981) than any other single institution in the United States
- offers its students enough telecourses to fulfill the requirements for an undirected A.A. degree (not enough for a major concentration)
- offers its students a broad range of centrally administered support services
- delivers learning services at numerous convenient locations in the community
- enjoys a close working relationship with the public libraries
- offers students a wide range of individualized learning options in both broadcast and independent-study modes
- markets some telecourses produced by other organizations as well as its own telecourses

### Problems Encountered

- having to rely on many other organizations in order to operate on a daily basis (e.g., television and radio stations, libraries, community organizations, computer centers, etc.)
- maintaining channels of communication among all the involved personnel that are effective enough to identify problems in their early stages
- dealing with courses produced by other institutions that are not accompanied by test banks

### Observations About Distance Learning

- most adult learners are busy people who have personal and professional commitments that discourage them from participating in anything but the most convenient educational delivery systems
- the majority of adult learners prefer not to come to class meetings
- most adult learners need career and educational information more than personal counseling
- enrollment in distance learning programs is greatly enhanced by a strong public information campaign and an easy (e.g., mail, phone) registration procedure
- telecourses can be improved by modularizing curricular units to facilitate delivery and updating of content material
- the useful life of a telecourse is generally five years

### Future Plans

- produce more television and radio courses, both independently and in cooperation with other colleges
- expand working relationship with military bases
- explore the use of cable television as a delivery mechanism
- explore the potential of serving learners overseas
- expand cooperative relationships with publishing companies

### Contact Persons

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### Enrollment

In the 1981-82 academic year there were 13,323 enrollments in CIS courses. This accounts for approximately 20 percent of all enrollments at Coastline. The enrollment figures are based on an average attendance at the fourth and tenth weeks of the semester. The completion rate varies between 55 and 60 percent in this tuition-free system; students often sign up for two or three courses more than they intend to complete because there is no required financial commitment.

### Administrative Structure

The Coordinated Instructional System Support Program is located within the office of the dean of instruction. Coastline Community College is one of three (Orange Coast and Golden West Community Colleges are the other two) colleges that constitute Coast Community College District and the only one without a formal campus. The organizational structure of Coastline Community College lends itself to the administration of flexible media-based courses like those offered by CIS. This is in part because it was created after Orange Coast and Golden West Colleges had already learned a great deal about administering such courses in the early 1970s. Begun in 1974-75 by administrators who had a clear mandate to offer nontraditional curricular options, Coastline Community College was able to develop an institutional management system geared to off-campus, media-based instruction. The CIS program employs 5 full-time and 14 part-time support personnel, along with 5 full-time faculty and 28 part-time faculty.

Coast Telecourses is the marketing and distribution division of the Coast Community Colleges. Not unlike a university press with an emphasis on complete learning systems, Coast distributes telecourses for use in broadcast and nonbroadcast formats to over 700 institutions throughout North America. By agreement, Coast Telecourses also distributes the prductions of the Southern California Consortium for Community College Television and the Bay Area Community College Television Consortium.

### Finances

The overall budget of the Coordinated Instructional Systems Support Program is approximately $380,000, not including telecourse production. The major expenses of CIS include salaries for course managers and the support staff, video stock, and postage. Financial support is based on average daily attendance funds from the state as well as institutional funds. Since CIS is administered separately from the Office of Telecourse Development and Design, which develops and markets Coastline's telecourses, income from the lease of courses nationally does not directly affect CIS. Funds from the lease of telecourses nationally go into a general districtwide fund, which contributes to the overall support of the three community colleges and the television station, KOCE. Financial figures on course production and leasing are not available.

### Resources Available

Telecourse descriptions, student catalog, Administrator's Guide to Telecourses, TV News Newsletter, Coast Communicator. Telecourses available through Coastline:

The Home Gardener, revised
Beginning Piano: An Adult Approach
Understanding Human Behavior[1]
You and the Law
The Growing Years[1]
Humanities Through the Arts[1]
Introducing Biology
Project: Universe[2]
Designing Home Interiors
Freehand Sketching/Applied Sketching Techniques
Voyage: Introduction to Career Education[3]
Needlecraft, Survey of Fiber Arts[1]
Personal Finance and Money Management[2]
Oceanus
Contemporary Health Issues[2]
Family Portrait[2]

[1] (Coproduced with one or more other institutions)

[2] (Produced by Southern California Consortium for Community College Television)

[3] (Produced by Bay Area Community College consortium)

# COLLEGE OF GREAT FALLS

## Telecommunications Program

TELECOM

## Educational Mission

The college of Great Falls is a small private college serving a 40,000-square-mile area of north central Montana. The college has in the past few years evolved from a primarily residential institution to one that now also serves a large population of part-time working adults in Great Falls and throughout the region. In addition to on-campus instruction, the college, through its TELECOM program, offers numerous undergraduate and graduate courses to 25 urban and rural learning centers. The vast majority (90 percent) of the learners served by the 21 rural learning centers are married women in their mid-thirties with children at home. By contrast, most (90 percent) of the learners served by the three urban learning centers in Great Falls are men between 20 and 40, employed as shift workers with the fire department or the local Air Force base. Very few students served by TELECOM (less than 5 percent) are concurrently enrolled in on-campus classes.

## Telecommunications Technologies

The TELECOM program uses video cassettes and a four-wire dedicated audio teleconferencing system to deliver courses to its 25 learning centers. Most TELECOM courses involve a combination of video cassettes and live interactive audio conferencing. Regular telephone service as well as the four-wire lines are used for some student/faculty interaction. The audio conferencing system uses locally leased, dedicated telephone lines and the Bell System 50A convenors.

## Curriculum

TELECOM offers lower-division introductory science, social science, and humanities courses (80 percent), graduate courses in education (15 percent) and some noncredit personal enrichment courses (5 percent). With the exception of two television courses per semester, leased through PBS's Adult Learning Programming Service, the video segments of all TELECOM courses are produced at the college by full-time faculty working in conjunction with TELECOM staff. Regular faculty classroom presentations are converted into one-hour videotaped segments and embellished with simple graphics, charts, and notations.

All courses produced by TELECOM are offered to students in a format that combines the videotaped segments (accounting for approximately two-thirds of the faculty presentation of content material) with the live, interactive audio teleconferencing segments. For the student, the average three-credit-hour course involves viewing a one-hour videotape and participating in a one-hour audio teleconference each week. In addition to using regular commercial textbooks, students work with print materials developed for the course by the faculty member. TELECOM normally offers 10 to 12 undergraduate, one to two graduate, and one personal enrichment course per semester.

## Faculty Roles

Faculty at the College of Great Falls not only design the curricular content of TELECOM courses, but they also conduct the videotaped presentations, lead the live audio teleconferences, prepare written materials for students, and discuss their courses informally with students via the telephone during designated office hours. Faculty who teach TELECOM courses are oriented to the system and receive considerable technical advice and assistance from TELECOM staff.

## Delivery System

The three learning centers in Great Falls are located at the local fire department, a city-county nursing home, and the local Air Force base. The 21 rural centers are located in public schools, hospitals, libraries, government buildings, and shopping centers in communities throughout the north central and eastern sections of Montana. Students are able to view the videotapes at a wide range of convenient times (usually totaling 8 to 12 hours during the day) at their closest learning center. Courses are designed so students can view the one-hour videotapes at their convenience and then participate with others in the one-hour audio telecon-

## Noteworthy Features

- combines videotapes with audio teleconferencing to serve a widely dispersed rural population
- serves an expansive rural area with the resources of a small private liberal arts college
- uses a highly flexible, low cost, interactive delivery system capable of serving 25 sites spread over a 40,000-square-mile area of Montana
- involves on-campus faculty in both videotaped presentations and audio teleconferences for off-campus learners
- employs part-time local coordinators at each off-campus learning site to assist faculty and students
- achieves better than a 90 percent completion rate among distance learners
- offers its weekly audio teleconferences at two separate times and audiotapes one of them for the convenience of the students
- offers students flexible financing arrangements (one-third down, two-thirds by the end of the semester) for paying tuition for TELECOM courses

## Problems Encountered

- managing the logistics associated with producing videotapes and audio teleconferences, supporting 25 learning centers, and distributing up to 165 videotapes each week
- learning how to manage a large-scale outreach effort in an economical and business like manner
- learning to work around the problems created by the lack of cooperation between major national and local independent telephone companies
- dealing with problems growing out of the lack of telephone company personnel trained to repair and maintain four-wire dedicated telephone lines
- integrating a new flexible delivery off-campus system into the established administrative procedures for registration, financial

aid, residency, and student services at a small private liberal arts college

### Observations About Distance Learning

- marketing and promotion for off-campus courses needs to be extensive, aggressive, and very professional if it is to be successful
- higher tuition charges of a private college seem to be an incentive to student persistence in distance learning courses once students are enrolled
- small, private colleges are able to make decisions quickly about establishing and modifying new programs
- distance learning delivery systems must be very flexible in order to meet the needs of working adults
- surveying current and potential learners concerning their preferences for future courses is one way of ensuring that program offerings meet real needs

### Future Plans

- expand programming available to learning centers
- expand the number of rural and urban learning centers
- offer professional continuing education to CPAs and employees of the Internal Revenue Service

### Contact Person

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ference at a regularly-scheduled time each week. Each faculty member offers the audio teleconference portions of his or her course two separate times each week for the convenience of students; upon student request the teleconferences are audiotaped for replay at the learning center. Each week videotapes are transported by United Parcel Service from the college to the various learning sites.

The role of the local site coordinator is central to the delivery system evolved by the TELECOM program. At each of the 23 sites a local resource person, employed on a part-time basis, assists students in the use of the audio teleconferencing system, helps maintain the teleconferencing equipment, serves as a communication link between the local community and the college, assesses student preferences for future courses, publicizes current courses, serves as an advocate for the distance learner with the college, proctors examinations, receives and disperses videotapes, and, in general, administers the local program.

Potential students can obtain detailed information about courses, faculty, and the process of learning at a distance from the TELECOM catalog, which is published prior to each term. Considerable effort is made to publicize the availability of TELECOM courses through newspapers, radio stations, and posters. Enrolled students also receive the TELECOM newsletter each semester.

## Enrollment

In the three semesters of the 1980-81 academic year (the second year of the program) enrollments in TELECOM courses totaled over 700, with a completion rate of over 90 percent. A $50 per-credit-hour tuition charge may account, in part, for this high level of persistence among TELECOM students.

## Administrative Structure

TELECOM is a separate program reporting to the dean of Continuing Education. It is intended as a vehicle to serve off-campus students rather than students already enrolled in on-campus courses. The TELECOM staff includes two full-time and one-and-a-half part-time employees.

## Finances

The TELECOM program was established in the spring of 1979 with a $20,000 commitment from the college plus one staff member on three-quarters release time. Since then, the TELECOM staff has built a half-inch television studio and established a network of 25 sites. The current annual budget is $140,000. Major expenses include telephone line costs, staff salaries, and various costs associated with producing video programming. Local coordinators are compensated by a combination of tuition waivers and a per student payment for people enrolled at their learning centers. Income is generated from student tuition. Currently, the TELECOM program is the recipient of a substantial grant from the Murdock Foundation designed to support program expansion and improvement.

## Resources Available

TELECOM catalog, course schedule, newsletter.

# COLLEGE OF SAN MATEO

## Telecommunications Program

Electronics Worksite Training Project

### Educational Mission

The Electronics Worksite Training Project is funded by the California Worksite Employment and Training Act (CWETA) to provide entry-level training for structurally unemployed adults and to upgrade training for workers already in entry-level or other limited-mobility jobs in the electronics industry. The majority of entry-level instruction for the structurally unemployed is traditional classroom and worksite training that does not make use of telecommunications technologies to deliver instruction and, therefore, is not the focus of this description.

The upgrade portion of the "CWETA project," as it is called, makes extensive use of computer and video technologies. The "upgrade" students are all employed in one of a number of electronics firms in the Bay area that participate in the program. Currently employed in jobs with little prospect for advancement (e.g., basic testing, assembling components, and various nontechnical jobs), the participants in the upgrade program tend to be between 30 and 50 years old, 55 to 60 percent female, and not presently enrolled in any on-campus classes. In addition, 40 percent are minority group members. Participants are recommended for the program by their immediate Supervisors, based on criteria that vary from company to company (e.g., tenure, attendance, ability). Students can earn as much as 18 semester units toward an A.S. degree from the College of San Mateo.

### Telecommunications Technologies

For its upgrade students the CWETA project uses learning stations that include Apple II computers with two disc drives (48K), half-inch videotape playback machines, various electronic testing equipment, and supplementary equipment for laboratory experiments, and skill development exercises. The print components, laboratory experiments, and skill development exercises, as well as the instructional material on the computer and videotape, are all managed by the computer. The computer/videotape interface, therefore, performs both the functions of computer-assisted instruction and computer-managed instruction. Telephones are also used for some student/faculty interaction.

### Curriculum

The CWETA project offers students a self-paced, open-entry/open-exit competency-based curriculum in electronics. The curriculum is designed to move from theory to very specific applications of the theory. Each day students are given reading assignments from the Heath textbook series in electronics. The next day students review the homework material on the computer. If they fail to answer questions, the computer refers them to the specific segment of the book that treated that topic. Next, students review videotapes (acquired from business or military sources) on some theoretical topic such as Ohm's law. The computer controls the videotape, which is divided into a sequence of short (two- to three-minute) segments with accompanying questions. Students are then tested on each module by questions that are randomly generated by the computer. To progress to the next module students must demonstrate competency by correctly answering 9 of 10 or 13 of 15 questions. The next step is to study a taped version of a laboratory experiment applying Ohm's law and again to answer related questions posed by the computer. Finally, students complete certain skill modules that apply Ohm's law to specific job-related tasks. Academic credit for the 18 semester units available through the CWETA project is awarded on a credit-by-examination basis by the college.

### Faculty Roles

Since the learning stations are located in electronics firms, and since the students are employed full-time, learning takes place at any time during the day when the student has time and the learning station is free. Rather than having a full-time faculty member on duty at all times and at all sites, the project operates a telephone hotline manned by an electronics instructor at the college. In addition to direct phone access to this faculty member, students can meet

### Noteworthy Features

- operates one of the only microcomputer/videotape interface instructional programs in the United States
- offers employees a self-paced, open-entry/open exit, competency-based curriculum in a worksite setting
- offers college credit to full-time employees on a credit-by-examination basis for job-related learning that occurs at the worksite
- enjoys a close working relationship with local industries
- developed the program after discussions between representatives of industry and the College of San Mateo about the educational needs of full-time employees
- chose its particular combination of technologies after a wide-ranging search for the most flexible delivery system
- uses "teachware" (combination of computer software and academic curriculum) developed largely by the project staff

### Problems Encountered

- implementing nontraditional instruction
- compensating for the lack of available instructional materials
- designing a program in the face of the dearth of existing models from which to learn about the application of these technologies
- finding staff with the necessary technical and interpersonal skills to work on such a project

### Observations About Distance Learning

- there is a substantial need for similar worksite-based educational programs that offer academic credit
- employees are highly motivated learners when the educational opportunity is conveniently available at the worksite and when they can get college credit for such education
- support services (e.g., counselor, faculty hotline) are extemely im

portant, especially at the beginning of such programs

- students do better when they get considerable positive reinforcement from both the faculty and the computer program itself (e.g., conversational tone, personalized responses, and encouraging feedback)
- most of the full-time employees would not have attended courses on campus but were able to attend at the worksite

**Future Plans**

- expand the project to include more companies
- obtain private sources of funding
- expand from general electronics into more specific curricular areas such as microprocessors and microwaves

**Contact Person**

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CWETA Project Coordinator
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with one of two field instructors who circulate among the 12 industry sites. Most companies also have one of their trainers or technicians available to assist students if they have problems. The CWETA project staff includes many College of San Mateo faculty, and they are available for telephone and face-to-face interaction with students

### Delivery System

There are currently 22 learning stations located at 12 different companies in the San Francisco Bay area. The project intends eventually to include 32 learning stations and 18 to 20 companies. In addition to the textbooks and learning stations, there are student binders containing print materials that indicate which programs the student is to run on the computer. Assistance is available to students from the telephone hotline, field instructors, and company trainers and technicians. The project employs a counsel/job readiness assessor, who assists companies in selecting upgrade candidates (on request) and is also available to provide counseling to upgrade students.

### Enrollment

There are currently 170 students enrolled in the upgrade program, and the expectation is that the number will reach 250. Students may leave the program or stay with it as long as they want. They can receive the 18 hours of college credit whenever they successfully complete the curriculum and demonstrate their competencies.

### Administrative Structure

The Electronics Worksite Training Project is a separate project within the College of San Mateo. It has a staff of 24 individuals, whose functions include instruction, administration, materials development, and clerical support. The upgrade program began in May 1981, and the entry-level program began in October 1980. The project has an industry advisory committee composed of representatives of some of the companies involved (e.g., Hewlett-Packard, Watkins-Johnson Corporation, Ampex Corporation, Apple Computer Corporation).

### Finances

The project is funded for $2.1 million over a 30-month period by the California Worksite Employment Training Act. The entry-level students, but not the upgrade program participants, receive stipends. Costs associated with the upgrade program include the research and development necessary to design and make operational a computer/videotape interface system that successfully integrates print, video, and supplementary electronics equipment. Adaptation of the "teachware" developed by the CWETA project staff would make future programs much less costly. Each learning station costs between $11,000 and $12,000.

# COLORADO STATE UNIVERSITY

## Telecommunications Programs

Colorado State University Engineering Renewal and Growth Program (ERG) and State University Resources in Graduate Education (SURGE)

## Educational Mission

Both programs seek to serve career engineers at work sites. SURGE, however, also seeks to provide graduate education in business administration, computer science, and natural science. ERG studio-produces and markets stand-alone, videotaped, noncredit short courses for use by practicing engineers, scientists, and technical managers more interested in knowledge than credit. SURGE videotapes live, for-credit classes on campus and distributes them for viewing at worksites by those pursuing one of several kinds of degrees. The typical ERG viewer is a midcareer engineer, working full time, who holds a bachelor's degree and is interested in updating current skills and knowledge or developing new job-related skills. Some ERG courses are translated into Spanish for the benefit of Spanish-speaking professionals. SURGE viewers typically are males who hold a bachelor's degree and work full time, but they tend to be younger than ERG participants and are interested in completing a graduate degree

## Telecommunications Technologies

ERG uses the facilities of a commercial-network-quality television studio at CSU to produce the videotaped short courses for direct distribution to its customers. Resources include professional producers and all the television equipment needed to produce a top quality product. The live (candid classroom) courses videotaped for SURGE are not edited and are distributed for viewing two days later at Colorado sites and five days later at out-of-state sites. Tapes are then returned for erasure and reuse.

## Curriculum

All courses are produced on campus. With few exceptions, ERG courses are developed by a leading faculty member working with a professional producer. A typical ERG short course consists of a set (from 6 to 32) of approximately 30-minute lectures, along with a study guide (lecture notes, overhead reproductions) and a textbook. Twenty-one such self-contained courses are now available from ERG. Course content is designed to be of immediate and practical use to worksite viewers. The short lecture format serves to minimize time lost from the job by the engineer and facilitates larger classes.

SURGE courses are designed to make available to distance learners at their places of employment a learning experience similar to that experienced by the on-campus graduate degree-seeking student. Degrees that can be earned through videotape mode alone are the MBA and master's degrees in computer science, atmospheric science, civil/electrical/chemical/agricultural engineering, and in several specialty areas of mechanical engineering. Very few SURGE students participate in on-campus courses. About 40 courses are offered each term of academic year and five during the summer.

## Faculty Roles

For ERG, faculty who are potential course producers are approached by the ERG director or the College of Engineering dean. Many of these faculty members regularly consult with private industry and governmental agencies and develop a sense of the subject matter of interest to career engineers. Once the short course is produced, a joint responsibility of the faculty member and the studio producer, the faculty member has little contact with viewers of the course. Courses are wholly self-contained.

SURGE-course faculty, in contrast, maintain contact with students in several ways. Faculty generally visit off-campus learning sites at least once each semester to meet with students and staff. When they have questions, off-campus students are encouraged to telephone a faculty member during regularly scheduled office hours. Resident professors are available for advising and for course assistance to students viewing courses in other states and overseas. SURGE faculty find they can accept invitations to travel and still maintain their course schedule using prerecorded tapes of the class session; further, faculty report that, as their contact with business and industry in-

### Noteworthy Features

*ERG*

- offers studio-produced, videotaped, noncredit short courses to professionals all over the world
- has the ability to respond quickly to purchase or lease requests
- records videotaped presentations in studios rather than in live classroom situations to control the quality of the productions and increase their marketability
- focuses on applied knowledge that learners can use immediately
- produces 30-minute instructional segments that minimize companies' expenses by taking engineers away from their jobs only for short periods

*SURGE*

- videotapes live on-campus graduate classes for delivery to professionals at their worksites in and beyond Colorado
- enjoys the close cooperation of three colleges (Business, Engineering, Natural Science) and the Continuing Education Division
- erases and reuses videotapes to ensure that course materials are current
- enjoys strong local leadership in the person of the College of Engineering dean, an early advocate of using new technologies to reach off-campus learners

### Problems Encountered

*ERG*

- dealing with some customers who reproduce CSU videotapes and printed material thereby infringing upon copyright
- adjusting the workload for certain courses where the demand is so high that adequate quality control and order processing requires staffing that exceeds authorized personnel allowances
- finding technically qualified personnel capable of translating courses into Spanish

*SURGE*

- trying to serve all learners while remaining financially sound (a problem that led to establishing a minimum class size of three)

### Observations About Distance Learning

*ERG*

- it is necessary to keep course segments to less than an hour to minimize time away from job
- learners want short, to-the-point, instructional units
- materials must be well documented and of high quality

*SURGE*

- working adult learners seem more motivated to learn and more self-directed than on-campus learners
- many faculty report that working adult students perform better than on-campus learners and are adept at applying their learning to their everyday work situations
- some students report faculty are better prepared for courses that are videotaped

### Future Plans

*ERG*

- continue to serve the continiuing education needs of engineers; this will probably mean the addition of management and business courses
- attempt to keep up with the knowledge explosion affecting the engineering and data processing professions

*SURGE*

- explore the use of new telecommunications techniques, such as the electronic blackboard
- seek funds for additional SURGE classrooms as the existing facilities are filled to capacity

### Contact Persons

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creases, so does the opportunity for consulting.

### Delivery System

Extensive marketing channels have been developed by ERG among private industry in the United States and abroad. ERG also makes both the studio-produced short course and the candid-classroom (SURGE) courses available to industry and government out of state through the 22 leading engineering schools comprising AMCEE, the Association for Media-based Continuing Education for Engineers, Inc. (a full description of AMCEE is in this book). In 1979-80, ERG received about 1,100 orders for its short courses. Orders are processed by mail or phone, and the videotapes distributed by United Parcel Service or air freight. Purchase and leasing of ERG-produced courses have continued to grow since ERG began in 1975.

In 1979-80, SURGE courses were viewed at over 40 off-campus sites that were mostly in-state including Hewlett Packard, Coors Brewery, Bell Laboratories, and the Denver Public Library. About 37 different courses are taped and distributed each semester. At each off-campus site, an "education officer" (an honorary title) handles the videotape machine, tape distribution class scheduling, exam monitoring, and registration collection. As part of a statewide exchange agreement, two- and four-year college and university libraries and some public libraries extend full borrowing privileges to SURGE course enrollees.

### Enrollment

Those participating in ERG short courses do not "enroll" or take examinations. ERG program staff members maintain no records on the numbers of persons actually viewing the courses at worksites. SURGE course viewers totaled about 400 to 450 per semester in 1979-80, with these figures derived from 4th- to 5th-week course registration and payment records. Enrollment has been growing gradually, and about 525 people were enrolled in the spring of 1981. Since 1967, when SURGE began, about 200 persons have earned a graduate degree, typically taking four years to do so.

### Administrative Structure

ERG and SURGE are not administratively linked nor is there regular, formal contact between the two programs. SURGE is lodged within the Division of Continuing Education, and its director also serves as the associate director for continuing education. The SURGE director reports to the Assistant Academic Vice-President. ERG is located within the College of Engineering, and the director reports to the college dean. The ERG staff includes a full-time director and three FTE support staff, and the SURGE staff includes a quarter-time director and full-time assistant.

### Finances

Both programs are wholly self-supporting. ERG depends on revenues generated from the purchase or lease of its short courses. Major expense items are: TV studio time, ERG staff salaries, printing, telephone, mailings, royalty payments to faculty members, and payment to the CSU general revenue fund. Costs for the purchase or leasing of the videotapes and related printed materials vary according to course length. Detailed financial information about the operation of the program is not available.

SURGE depends on tuition payments for continued operation. Recently, however, a "SURGE Associates" program was initiated within the College of Engineering; thus far, five company members have pledged to provide a 1.5 match on tuition collected from their employees payable to the university department sponsoring the course. Major SURGE costs include support to Instructional Services for student camera operators, equipment maintenance/repair, materials purchase, and shipping. The academic year operating budget is approximately $200,000. The tuition charged is higher than for on-campus courses. Continuing education tuition must cover the full cost of instruction and receives no state reimbursement.

### Resources Available

For ERG, a description of available videotape courses; tapes and study guides (for review via rental arrangement). For SURGE, course bulletin, course tapes, books, and study guides (available for on-site review).

# COLUMBUS TECHNICAL INSTITUTE (CTI)

## Telecommunications Program

QUBE Interactive Cable Television Courses

### Educational Mission

Columbus Technical Institute (CTI) offers lower-division undergraduate courses over the Warner-Amex interactive cable television channel called QUBE. Students taking the courses are generally in their late twenties and early thirties. Approximately 60 percent are female, and 85 percent concurrently are enrolled in on-campus classes. In addition to the courses aired over the QUBE channel, CTI offers many videotaped courses in an independent-study mode to accommodate the scheduling needs of on-campus students.

### Telecommunications Technologies

CTI uses interactive cable television, the QUBE system, videotapes, and telephones to serve its students. Most of the programming on QUBE is provided through videotapes, although several sessions each quarter are scheduled where students are able to interact with the faculty member by using a hand-held digital polling device that relays their responses to a computer in the television studio. The computer summarizes the responses for the faculty member.

### Curriculum

The courses offered over QUBE are lower-division communications and business subjects. Approximately half the courses offered by CTI over QUBE are designed by institute faculty working as individual course developers and on-camera presenters. The production format is straightforward, only a modest amount of graphics is used to complement faculty members' presentations. Faculty-prepared student study guides and commercial textbooks are included with CTI courses. All other courses are leased from national distributors.

### Faculty Roles

Faculty design and teach approximately half of the video courses produced by the institute. Faculty also have responsibility for managing all courses, whether produced by CTI or leased from others. For courses offered on QUBE, faculty conduct live, interactive segments to get feedback from students on the pace of the course and on topics that need expansion or clarification. Telephone calls between faculty and students are the primary mode of communication, along with face-to-face visits during office hours. Students mail written assignments to the faculty for grading and comments; these are returned by mail to the students.

### Delivery System

Approximately two of the twenty television programs that constitute the video portion of each CTI course every quarter are delivered in a live, interactive format. Originally faculty attempted to make each program live and interactive, but they found this required too much preparation and did not leave sufficient time for presentation of curricular material. During the interactive sessions, students respond to questions posed by the faculty members by pushing the appropriate button on their digital polling device. A computer in the studio subsequently provides the faculty member with a summary of the student responses. Each noninteractive video segment is repeated five to six times per week on campus.

QUBE students come to campus two or three times each quarter to take tests. Some courses require students to complete written assignments, which are graded and returned with faculty comments by mail to the students.

### Enrollment

In the 1980-81 academic year CTI had 45 students in 6 sessions who took courses for credit over QUBE and 636 in 17 sections who took independent study courses using on-campus videotapes. Data on completion rates are not available. QUBE enrollments are relatively small, in part because there are only 35,000 to 40,000 QUBE subscribers. Because QUBE is an interactive technology, CTI staff know there are an average of at least 50 to 150 QUBE subscribers who view the courses but do not register.

### Noteworthy Features

- uses live, interactive cable television to serve learners beyond the campus
- combines videotaped course segments with interactive segments at roughly a 10-to-1 ratio for each course
- offers a large number of videotaped courses in an independent study mode

### Problems Encountered

- adjusting to the increased time required by faculty to prepare questions and have computers programmed for live interaction sessions
- working within the limited size of the QUBE subscriber population (35,000-40,000) hampers CTI's ability to attract enough students to conduct meaningful evaluations of interactive cable
- helping faculty adjust to interaction with students they cannot see

### Observations About Distance Learning

- learners who choose to learn via cable television seem more highly motivated than regular on-campus students
- some adults enroll in courses after first viewing video segments on the cable
- on-campus students find videotaped television courses very convenient

### Future Plans

- conduct more courses over the QUBE system
- participate in the telecommunications activities of the recently formed Higher Education Council of Columbus
- work cooperatively with other technical colleges and vocational high schools to provide professional continuing education programming for business and industry employees

**Contact Persons**

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## Administrative Structure

Television courses offered over QUBE and on videotape for on-campus students are not managed by any separate program within CTI. The media coordinator and the administrative assistant to the vice president for education are the two individuals with primary responsiblity.

## Finances

Because the administration of the television courses is so thoroughly integrated into the institution, it is not possible to come up with a single overall budget figure. The time of the two administrators and of the faculty is paid for out of separate budgets. Major expenses include salaries, videotape, interactive video sessions (approximately $60 per half-hour session), and lease fees for acquired courses. Warner-Amex Corporation, which owns the QUBE system, provided all the resources for the early experiments with the interactive capacity and still contributes considerable staff and equipment time to CTI. The basic subscription fee for QUBE is $13 per month, and this allows any QUBE subscriber to view the telecourses.

## Resources Available

Student packets.

# COMMUNITY COLLEGE OF PHILADELPHIA

## Telecommunications Program

Community College at Home Project

### Educational Mission

The Community College at Home Project is an informal cooperative effort involving 12 community colleges in a three-state area. Since its beginning in 1980, the Community College at Home Project has acquired television courses, coordinated joint promotional efforts, and established and maintained working relationships with local commercial and public broadcasting television stations. All the colleges in the project are located in the Delaware Valley Tri-State Area (Delaware, southern New Jersey, and southern Pennsylvania) and offer the courses for credit to distance learners. The average student is a woman, (two-thirds), at home, earning credit toward a college degree, and age 22-42. Working adults over 50 years represent the second largest target group, after women taking care of children at home. About 10 percent of the students are on-campus learners. Most of the off-campus students are white.

### Telecommunications Technologies

Until January 1982, project courses were broadcast by an ABC-affiliate station (WPVI of Philadelphia). Since that date courses have been offered over a local PBS station. Some of the colleges also rebroadcast the programs over local cable channels. All colleges make extensive use of telephone for faculty/student interactions, providing 24-hour message-taking service. In addition, the central project office uses a uniform telephone call distribution system to answer inquiries from potential students and to channel them to member colleges during the six-week promotional campaigns that precede each semester of course offerings.

### Curriculum

The Community College at Home Project offers three open-broadcast liberal arts courses per semester. All are offered through the participating community colleges as credit courses. Leases are acquired through the Eastern Education Consortium, an educational television-purchasing consortium of which the 12 community colleges in the At Home Project are members. None of the courses is produced by the project, nor by the Eastern Education Consortium. In addition to the televised segments, courses include study guides and commercial textbooks. Faculty at the local college often develop supplementary materials.

### Faculty Roles

A committee composed of representatives from each college, (often faculty members) reviews and selects nationally distributed telecourses for use by the project. Once the course selections for the future semester have been made, faculty preview tapes, study guides, and any other materials provided in the course packet. Each college determines how much credit to offer, whether to require supplementary field trips or seminars, and what orientation or additional materials to supply the student. Once a course is underway, faculty have responsibility for grading assignments and exams; for supporting their distance learners during announced telephone and office hours; and for leading any seminars, field trips, or orientation sessions individual colleges choose to offer. These sessions are mandatory at some of the colleges, optional at others. Faculty workshops and support service are provided by the project coordinator.

### Delivery Systems

In addition to the open television broadcast of course programs, which most students view at home, each campus has videotape copies for make-up or review sessions. As a commercial station, WPVI time slots for courses have occasionally been preempted by unanticipated special events. To compensate for this situation, the station set aside a preannounced make-up time slot, which was crucial to the early success of the project. After WPVI decided to change its morning format and to drop the telecourses as of January 1982, the project switched to a local PBS station as its vehicle for delivering courses. All participating colleges schedule faculty phone and office hours, and most now offer orientation and seminar sessions—up to five per course—to

#### Noteworthy Features

- involves colleges from three states in an informal cooperative arrangement, with no membership fees
- had a strong administrative and financial commitment from a commercial television during the initial years of project
- channels enrollment inquiries from three states to individual college members from a central phone system
- received contribution of $350,000's worth of air time per semester by a commercial television station to promote television courses

#### Problems Encountered

- obtaining initial agreement from colleges to work cooperatively
- overcoming each college's sensitivity about individual institutional identity and territory in order to promote courses jointly
- adjusting to the rapid change in priorities of the commercial station necessitated moving courses to a PBS station

#### Observations About Distance Learning

- unless the schedule of television broadcasts is reliable, distance learners will drop out in large numbers
- in general, distance learners tend to be more mature and articulate and have better academic skills than on-campus students
- some learners have negative self-images and an exaggerated fear of failure and, therefore, find distance learning more comfortable than attending regular classroom sessions
- distance learners prefer a well-structured program with human contact
- the student completion rate is substantially higher when seminars are required
- a good study guide is central to the success of distance learning programs because it organizes the whole learning process for the student

- good promotion is essential to attract distance learners because it can reduce the psychological barriers associated with taking a college course
- when broadcast over the commercial station, the project was reaching 17,000 households, according to an Arbitron rating

### Future Plans

- expand program to 17 colleges and universities
- offer courses from the ACSN satellite system and PTV-3
- substantially increase promotional effort by involving several advertising agencies
- plan wine and cheese parties to encourage student networking
- explore the potential of other delivery systems capable of reaching students in other settings other than at home (e.g., the workplace)
- explore the possibility of linking up with another commercial television station in the area

### Contact Persons

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increase student/faculty interaction. In addition, distance learners are permitted use of learning labs, libraries, counseling, and other support services available at the campus of the college they attend.

### Enrollment

During the two semesters of 1980-81, the Community College at Home Project enrolled 580 students and 582 students, respectively. Enrollment at participating colleges ranged from 13 to 209. After two semesters of operation it is too early to determine an enrollment trend.

### Administrative Structure

The Community College at Home Project is a loose consortium of 12 community colleges. The Community College of Philadelphia, which initiated the project, provides office space and salaries for the project coordinator and part-time secretary. Though not bound by any formal agreements, each member college contributes money for promotion and appoints a project representative, who also handles on-campus project coordination. All At Home Project institutions are members of the Eastern Education Consortium, through which two courses are acquired each semester based on a total consortium membership vote. Each Home Project member also selects a third course for exclusive use and pays for it separately. Television station WPVI, Philadelphia, was clearly an essential partner in the early development of this informal cooperative effort, providing promotion assistance, technical services, and cooperation in addition to broadcast time for the courses.

### Finances

The largest components of project expenses were originally underwritten by in-kind contributions from television station WPVI. WPVI provided free air time for course promotion spots (at an estimated value of $350,000/semester), blank quad tapes, and engineering time for reproducing copies, as well as the air time for program broadcasts. Participating college contributions included an initial charge of $400 for radio and newspaper promotion, a $400 annual fee to the Eastern Education Consortium, the cost of an on-campus coordinator, and approximately $1,800 per semester for reproducing a set of tapes for three courses. In addition, the largest college in each of the three states assumes the cost of the central phone line during student registration, and the Community College of Philadelphia covers central project coordination costs. There are no At Home Project membership fees. TV course tuition charges are the same as those for any other course offered by project member institutions.

### Resources Available

Sample press kits and brochures, Telecourse Executive Summary, sample promotional model for cooperative efforts.

# DALLAS COUNTY COMMUNITY COLLEGE DISTRICT (DCCCD)

## Telecommunications Program

Center for Telecommunications (previously called the Instructional Television Center)

## Educational Mission

The Center for Telecommunications has, since its first experiments with televised instruction in 1972, been providing the residents of Dallas County with the opportunity to earn college credit while learning at home. Drawing upon the resources of the seven Dallas County Community College District campuses, the center is able to offer lower-division television courses (telecourses) to a broad range of learners. More than three-quarters of all Dallas telecourse students are working adults employed part time or full time in white-collar jobs or in homemaking. Approximately 60 percent are female. The average age is around 30. Most have family incomes in excess of $15,000. More than 85 percent are high school graduates; 50 percent have had some college, about 10 percent have a four-year or higher degree, and approximately one-third are concurrently enrolled in on-campus classes. The ethnic composition closely reflects that of the on-campus population: approximately 78 percent Caucasian, 17 percent Black, 3 percent Hispanic, and 2 percent "other." The program also serves students who are handicapped or homebound and unable to come to one of the campuses.

## Telecommunications Technologies

The center uses public broadcast television, cable, videotape, and telephone to serve its learners. Both public and commercial broadcast radio have been used.

## Curriculum

Most telecourses offered by the center are introductory-level core and elective liberal arts courses. Center staff have focused their television production efforts on introductory core courses and have leased both elective and core courses from other telecourse producers. Dallas has produced ten telecourses on its own, shared in the production of three other telecourses and a radio course, and has leased another eight courses from other producers. Most Dallas telecourses consist of 30 half-hour television segments plus a student study guide (written by the faculty) and a commercial textbook or textbooks.

Responsibility for coordinating telecourse operations for the district resides with the center. However, in order to ensure both maximum effectiveness and faculty acceptance of this alternative delivery system, each of the seven colleges administers its own management system. Telecourse students regularly are enrolled in their respective colleges and are entitled to full college services.

This pattern of centralized coordination by the center and decentralized management by the colleges is reflected in the DCCCD approach to course production and the approval of leased telecourses. Courses produced elsewhere that are under consideration for leasing are evaluated by a committee composed of one faculty member of the appropriate discipline from each of the seven colleges. If a course is recommended by the committee and approved by the vice president of instruction, center staff make minor, or even major, adaptations in the course before it is offered.

When DCCCD sets out to produce a telecourse, a similarly structured academic advisory committee of discipline-based faculty is selected by the vice presidents of instruction of the colleges. The center's director, instructional designer, and course implementation specialist are also members of the committee. The committee develops a blueprint for the course including course, unit, and lesson goals objectives, course components, learning activities, print materials, and course management procedures. One of the committee faculty members is selected as the content specialist and is given full release and time to serve as the chairperson of the academic advisory committee and as a member of the course production team. This team also includes an instructional designer, a producer, a production assistant, and at least one scriptwriter. The faculty content specialist has final sign-off responsibility for the academic content, and the instructional designer has the same responsibility for the overall

**Noteworthy Features:**

- ranks as one of the most prolific producers and distributors of telecourses nationally
- centralizes coordination and decentralizes management of a distance learning program in a seven-college system
- involves faculty extensively in the selection, production, and management of telecourses
- enjoys cooperative relationships with PBS station KERA (sells 30 hours of air time per week to DCCCD), Tarrant County Junior College District, the Dallas County Public Library systems, and the Association for Higher Education (TAGER)
- makes available extensive student support services
- serves one of the largest telecourse student populations in the country
- offers on-site consultant service to assist institutions leasing telecourses from DCCCD
- is centrally involved in the design of educational services to be offered as part of the Dallas cable television franchise

**Problems Encountered:**

- overcoming resistance to the use of instructional television on the part of some faculty in spite of efforts to involve them and in spite of the enthusiastic support of faculty already involved
- encouraging a greater sense of involvement with telecourse students (compared with on-campus students) among faculty and staff at the seven colleges
- determining a satisfactory distribution of income between the center and the seven colleges
- determining how high the level of cable penetration has to go in a community before most programming may be delivered by cable
- anticipating the potential impact of any changes in state-level policies toward the funding of courses using television
- paying for the high cost of air time

- adjusting to the increasing cost of television production
- planning in the face of rapid technological changes

### Observations About Distance Learning:

- commitment from upper-level administrators and members of the board of the trustees is crucial to the success of an alternative delivery system
- even in a metropolitan area where there is a community college campus within a 20-minute drive of all residents, many students still prefer the convenience of telecourses
- faculty can be very supportive of instructional television if program staff are willing to actively involve them in the process
- a heterogeneous team of educators and technicians can work together effectively to develop a highly professional product
- when properly organized and funded, a television delivery system can be made cost-effective
- it is now, and will become even more necessary for colleges to work together in informal and formal cooperative arrangements to serve distance learners successfully
- cooperative arrangements between educators and commercial publishing companies to develop distance learning materials can be mutually beneficial and are likely to increase in the near future

### Future Plans:

- design courses so they can be more easily adapted to different types of educational delivery systems (e.g. modularize video segments to accommodate open broadcast, cable, videotape)
- undertake more cooperative ventures with other colleges, commercial publishers, cable companies, and businesses
- program the new educational cable channels provided in the Dallas franchise
- use the increasing availability of

instructional design of the course. Members of the academic advisory committee and the content specialist work out together any major differences in presenting the course content. Committee members review scripts and may appear as interviewees in some televised segments.

As much as possible, center staff try to reduce costs by using film and video resources in their telecourses. Since DCCCD must lease television studio facilities, center staff try to shoot as much as possible of their own film outside a studio environment. Video production work is done by a combination of full-time center staff and freelance professionals hired on a project basis. The on-camera host for the courses can be the content specialist but is usually a professional actor reading a prepared script.

## Faculty Roles

In addition to having a central role in the selection, design, writing, production, and approval of telecourses, DCCCD faculty are actively involved in managing and teaching the courses. The faculty member who serves as content specialist during the course production process usually serves as the district coordinator for the course once it is offered. Each course, whether produced or leased by DCCCD, has someone in this role who coordinates assignments, activities, and grading practices among the one or more instructors who are responsible for the course at each college. Instructors are either full-time or adjunct faculty. Telecourse instructors conduct on-campus meetings; keep student records; contribute to newsletters, test banks, and course evaluation; grade tests; and communicate with students in person and via telephone. Each course coordinator prepares a faculty guide for the telecourse instructors teaching that course. Every faculty member also has a *Telecourse Procedures Notebook*, which serves as a faculty handbook.

## Delivery System

Students can watch the video programs on open-circuit broadcast and/or cable television or they can view videotapes at the colleges' learning resources centers or at two branches of the public library. The students can obtain advice and assistance from their respective telecourse instructors via telephone or in person. Some student support services coordinated centrally by the center staff include a staffed telephone hotline with information about the telecourses and three or more newsletters (per course, per semester) informing students about tests, class meetings, schedule changes, study hints, etc. Most telecourse instructors hold three or four on-campus optional meetings with their students for discussion and review. Some class meetings include special guest speakers, debates, or films. Students are required to attend an initial orientation session for each telecourse, because center staff found that such meetings have a positive effect on student success. A telecourse information booklet summarizing information on telecourses is available to students each semester. Each week two programs from each course are broadcast by the public broadcasting station (KERA). Several courses are also broadcast on local cable channels. Each program is repeated at least once each week for the convenience of students.

## Enrollment

In the 1981-82 academic year there were 9,284 enrollments in telecourses at DCCCD campuses (as of the fourth week of the semester). The completion rate for telecourses ranges between 50 and 75 percent.

## Administrative Structure

The Center for Telecommunications is a district-wide program under the office of the vice chancellor of educational affairs. The center employs 16 full-time and four part-time staff, plus a number of freelance production specialists.

## Finances

The overall 1980-81 budget for the center was approximately $1.5 million, which included production, general administration, marketing, and telecourse delivery. Major expenses include staff, production, printing, tape dubbing, postage, and air time. Major sources of income include state reallocation for student contact hours, telecourses leased to other institutions, and study guides purchased by others. Revenues from open broadcast telecourses are split 70 percent to 30 percent between the center and the seven colleges. DCCCD and the nearby Tarrant County Junior College District benefit mutually by sharing some resources and services.

### Resources Available

*TV Close-Up, The First Six Years, Instructional Television Catalog, Telecourse Procedures Notebook*, preview materials for courses, telecourse information booklet for each semester, sample study guide lessons, and consultant service.

*Television Courses:*
American Government I
American Government II
Writing for a Reason
Communicating Through Literature
It's Everybody's Business
Earth, Sea and Sky
In Our Own Image
The American Story
America
The Second Century
The Living Environment
Focus on Society
*Audio Course:*
The World of F. Scott Fitzgerald

cable television time to expand opportunities for faculty to get involved in instructional television

### Contact Person

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# EASTERN EDUCATIONAL CONSORTIUM

### Noteworthy Features

- constitutes one of the largest telecommunications consortia in the United States
- combines two-year, four-year, public, and private educational institutions along with broadcast and cable facilities and publishers in the same consortium
- involves organizations in five states
- achieves cooperation among colleges and broadcasters in the Northeast region of the country, where the student and college populations are most dense and where there are more overlapping broadcasting signals than anywhere else in the country
- provides, in most cases, a six-month lead time between course selection and broadcast, allowing institutions time to develop supporting curricular and logistical materials.
- is governed by a board with less than a majority of its membership coming from higher education institutions
- broadcasts telecourses all over the country since the New York commercial television station WOR is carried by many cable networks

### Problems Encountered

- overcoming resistance to an educational delivery system that does not limit itself to traditional geographical or organizational turf boundaries
- devising operating procedures that allow democratic participation by a large number of organizations with different interests and levels of commitment
- providing technical assistance and advice to participating institutions concerning the nature and extent of student support services necessary for distance learners
- obtaining accurate, timely, and comparable data about enrollments, student characteristics, telecourse evaluation, and member institution needs, priorities, resources, and expertise

## Educational Mission

The Eastern Educational Consortium (EEC) was established to develop and promote alternative approaches to instruction in higher education that use television and other media-based delivery modes. The EEC focuses on adult students seeking alternatives to on-campus instruction. Initially called the Tri-State Consortium (founded in 1973), which included 12 institutions in three states and one PBS station, the EEC has grown to include 45 two-year and four-year public and private colleges and universities in five states—New York, New Jersey, Connecticut, Pennsylvania, and Delaware—and currently works in cooperation with commercial, public, and cable television stations. The EEC has begun to collect comprehensive data on students taking the television courses (telecourses) offered by member institutions. The consortium is assumed to be serving a population of older, working, and homebound adults who are pursuing higher education on a part-time basis.

## Telecommunications Technologies

The consortium uses public, commercial, cable, and closed-circuit television to reach its students. Sometimes colleges will rerun programs on cable that were initially broadcast on a public or commercial station. Telephones are used extensively for student/faculty interaction. One member college with videotape duplicating equipment provides copies of telecourse master tapes for on-campus use as a service to other consortium members.

## Curriculum

Most EEC courses focus on liberal arts subjects; courses in business and health also are offered. Courses are selected from among those currently available from producers of educational television programming and from PBS's Adult Learning Programming Service. The consortium is primarily a user-based organization; however, it will begin to produce courses in cooperation with other organizations in 1982. Since 1976 the EEC has leased a total of 15 telecourses, normally two courses each semester. EEC institutions may supplement the print materials prepared by the telecourse producers with their own materials, but they do not as yet produce their own study guides or texts.

## Faculty Roles

The EEC's course selection process is managed by a committee of faculty and broadcasters from member organizations. Members of faculty at consortium institutions can participate in the course selection process in three ways:
(1) by offering input to members of the course selection committee that makes recommendations to the membership; (2) by voting on the committee's recommendations at a general membership meeting; and (3) by participating in a mail ballot. Local autonomy and decision-making are the responsibilities of member institutions. Educators at each individual institution decide whether to offer a course selected by the consortium; how much credit to offer; and what supplementary seminars, field trips, or other activities to offer or require. Once a course is under way, faculty are responsible for supporting their distance learners during announced telephone and office hours and in seminars or other supplementary activities.

## Delivery Systems

Along with the initial television broadcast, member institutions can obtain duplicate tapes for use in their libraries and resource centers for rebroadcast on local cable networks. Once course selections are determined, the consortium negotiates distribution arrangements on behalf of its college members with various television stations in the five-state area. Affiliates of ABC and stations WOR, WNYE, and WNET of New York, WXII and WVIA in Pennsylvania, New Jersey Public Broadcasting, and nearly 30 cable operators have aired consortium telecourses. By programming over WOR, which is carried by many cable networks nationally, EEC provides telecourses to colleges all over the country.

Most students view the television segments at home. All participating colleges schedule faculty phone and office hours, and many offer orientation sessions, seminars, meetings with guest speakers, or field trips to increase opportunities for student/faculty interaction. Field trips are made to places such as museums, concert halls, department stores, and natural environments.

## Enrollment

The EEC is currently collecting data on student enrollment in consortium-arranged telecourses by conducting a comprehensive survey. Enrollment in EEC courses in the 1980-81 academic year was approximately 2500. Data on completion rates are not yet available.

## Administrative Structure

After seven years of existence, the consortium incorporated as a nonprofit corporation in the spring of 1981. Four people on the 13-member board of trustees are from member colleges. The other board members represent higher education agencies and associations and telecommunications or broadcast organizations. In order to promote cooperation between colleges and organizations in the field of communications, two basic membership categories were created: institutional membership, with dues-paying members from colleges and universities in the five-state region; and cooperating membership, comprised of broadcasters, cablecasters, publishers, and other noncollege groups that contribute in-kind services. In addition to a broad standing committee on finance, there are several special committees of member representatives, which assist the executive director and three part-time staff members of the consortium. These include committees on publicity, faculty support, uses of computer technology, and a preview process committee to improve faculty involvement in previewing and selecting courses.

## Finances

The consortium has been supported entirely by annual fees of $400 per institutional member and by extensive in-kind contributions. Membership fees, which currently total some $20,000 per year, pay for telecourse leases and course distribution. Colleges that offer the courses also must pay the producer of the telecourse $10 per enrolled student. Most other expenses are covered by in-kind services or contributions. For example, Bergen Community College in New Jersey provides consortium offices, staff, and salaries; for a service fee it duplicates videotapes for other colleges. Another college provides computing services. Commercial and public broadcasters and cable operators provide free broadcast time along with some advertising and technical assistance.

## Resources Available

Consortial Agreement, consortium by-laws, list of courses, brochure.

- overcoming faculty resistance to using telecomunications technologies to deliver education
- dealing with funding policies that differ from state to state

## Observations About Distance Learning

- telecourse students tend to have a high level of previous educational attainment
- minority groups are underrepresented in the telecourse student population
- telephone questions from students more often concern administrative matters than course content issues

## Future Plans

- introduce radio courses
- conduct a survey of the needs of participating students and faculty
- develop workshops and other opportunities for faculty development and mutual support
- translate one or more courses into Spanish
- explore the use of computers for distance learning
- establish linkages with other consortia for regional nationwide planning
- expand EEC's financial base

## Contact Person

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# EASTERN OREGON STATE COLLEGE

**Noteworthy Features**

- serves an extremely expansive (50,000 square miles) rural region in which most people have few, if any, alternative educational resources
- uses a wide range of technologies and flexible delivery system arrangements to meet the diverse learning needs of its rural students
- brokers the educational services of other colleges and universities when EOSC cannot offer such services to residents of the region
- cooperates with local community organizations (e.g., libraries, high schools, chambers of commerce, etc.) to provide 10 outreach centers for off-campus students
- is fully integrated into the regular academic programs and administration rather than existing as a separate off-campus program
- uses the same instructional package to serve students at different academic level (e.g., undergraduate, graduate) by requiring different student assignments
- guarantees students all advertised off-campus courses will be offered even if only one person signs up
- registers off-campus students six weeks early in order to tailor-make the delivery arrangements if necessary
- uses telecommunications technologies only to fill in delivery system needs that cannot be met adequately by face-to-face instruction
- employs a circuit-riding counselor to serve students in remote outreach centers

**Problems Encountered**

- overcoming "turf" problems with other agencies and colleges, an on-going problem that has diminished appreciably over time
- gaining complete cooperation from universities in other parts of the state that are active in EOSC's service region; individual programs tend to act as semi-independent schools or departments, making it difficult to es-

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## Telecommunications Program

Division of Continuing Education and Regional Programs

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## Educational Mission

Eastern Oregon State College (EOSC) is a multipurpose, four-year public college that serves a 10-county region in sparsely populated northeastern Oregon. In addition to regular, on-campus undergraduate and limited graduate curricula, the college has a special state mandate to reach and provide educational opportunities to rural adults who do not have access to campus-based instruction. As a result, the Office of Continuing Education and Regional Programming, which has responsibility for off-campus programs, utilizes a variety of delivery systems and technologies to serve leaners in its region.

When the college cannot meet an educational need identified in a given community, the Continuing Education staff facilitate (or "broker") necessary courses through another college or university. The 10-county service area is expansive (50,000 square miles) and sparsely populated (about five people per square mile, with only five towns having a population of over 5,000). Two community colleges are located in the region, yet seven counties are without community college service.

The college's off-campus [illegible] are older (i.e., average age of 30) than their on-campus counterparts. They are generally place-bound, working adults who are residentially distant from a college campus. Approximately 10 percent of the off-campus students also are enrolled in on-campus courses; however, all enrolled students are treated as on-campus students regardless of the location in which their learning occurs.

## Telecommunication Technologies

A variety of technologies are utilized, depending on the nature of local community needs. Although live classroom instruction is considered the first instructional preference of students and faculty, public broadcast television, videotape and audiotape, audio teleconferencing, audio-tutorial, and a limited amount of computer-assisted instruction all are used. Videotapes and audiotapes of live, on-campus courses often are distributed to areas in which the need for the given course has been identified but where enrollment is insufficient to justify a live instructor. Audio teleconferencing, employing an inward WATTS telephone line, is sometimes used to augment videotape, audiotape, and independent study courses so that students have personal contact with a faculty mentor.

In addition, the college leases some video courses from national distributors through its participation in the Oregon Community College Telecommunications Consortium. Many of the areas in the region do not have access to public television, and still others receive Washington or Idaho public television, making it difficult for the college to offer credit classes through regular PBS broadcasting. This is one of the main reasons for EOSC's reliance on its own distribution system.

## Curriculum

EOSC offers lower- and upper-division liberal arts courses as well as professional continuing education programming to its students. The professional continuing education courses that are offered or brokered by the college serve nurses, pharmacists, realtors, attorneys, doctors, and teachers, among others. In addition, the college offers an undergraduate external degree in general studies and informal adult education courses.

## Faculty Roles

EOSC's regular faculty have responsibility for developing their own on-campus and off-campus courses. Faculty involvement in the delivery of off-campus instruction includes teaching regularly scheduled class sessions located in the community and periodic meetings with smaller groups of students taking courses through media other than live instruction (e.g., videotape). Faculty also review and approve all courses that are produced by another agency or institution and offered for EOSC credit.

In addition, faculty are responsible for supervising all related support services (e.g., career planning, counseling), whether provided on or off campus.

Faculty who participate in off-campus activities do so as part of their regular assignments, and their on-campus assignments are reduced accordingly. In addition to regular faculty, the off-campus program employs local resource people with expertise in given areas as adjunct faculty on a course-by-course basis. They are also used as discussion leaders for media-assisted and correspondence instruction.

## Delivery Systems

No single delivery system prevails. Whatever combination of resources is most appropriate for a given community or learner is what is used. Off-campus classes, for example, may take place at one of the off-campus program's 10 outreach centers, at a local chamber of commerce, on a community college campus, or in a library, high school, bookstore, or worksite, depending on the needs and resources of the local community. The 10 outreach centers have responsibility for identifying learning needs in their respective communities and facilitating appropriate courses by working through the central office of regional programs. Five of the centers are staffed by a half-time or less than half-time coordinator on the college's payroll and the other five are operated as in-kind contributions by local agencies concerned with education (e.g., a high school, educational service districts, etc.). The staffed centers intentionally have been affiliated with local agencies or organizations to enhance acceptance and visibility within the community. There is also one circuit-riding counselor who, supported by in-kind contributions, travels among the outreach centers providing career information, counseling, and advising services to local adult learners.

EOSC courses may be delivered anywhere within a local community that seems appropriate. For example, since the centers are not yet fully equipped with video equipment, in one community a video course was offered by arranging to use a local auto dealer's video, playback equipment on-site in the dealership. In another, sheriff's deputies took a videotape course using equipment available in the sheriff's office. In still another, the two teachers in a small, very isolated school took a required continuing education course that was computer-packaged by using a home computer owned by one of the participants.

Regardless of delivery system, individual courses often bring together a variety of learners: some take the courses as part of an external degree program, others are meeting continuing education requirements, and still other are nonmatriculated undergraduate students. Different course requirements are built around the same instructional package to satisfy the various student learning objectives. By doing this and utilizing a variety of delivery techniques, the college is able to guarantee that a course will be offered, regardless of variations in the learning needs or number of enrollees. Registration for off-campus classes occurs six weeks in advance so that time is available to tailor instructional delivery modes. All advertised off-campus courses are offered even if it is on an independent study basis for one student.

## Enrollment

In 1980-81, 2,000 students were involved in off-campus instruction. Enrollments are continuous but reported quarterly to the state. Course completion rates are about 90 percent with a pattern of increasing enrollments. About 20 percent of EOSC off-campus students were involved in courses employing telecommunication technologies.

## Administrative Structure

The Office of Continuing Education and Regional Programs has responsibility for off-campus programs. The office is, however, fully integrated into the institution, with its director also serving as associate dean of academic affairs. Thus, the program is fully recognized as an important, integral part of the institution's mission, not as an auxiliary enterprise. It has a staff of six full-time and eight part-time employees.

## Finances

A grant from the Fund for Improvement of Postsecondary Education (FIPSE) was instrumental in helping the college establish regional centers and the outreach program. However, state support is the primary, ongoing financial mechanism, augmented by

tablish consistent points of communication and collaboration

- working around conventional state funding policies that treat EOSC exclusively as a four-year college, even though it also provides services normally offered by community colleges to many communities in its region
- trying to use open-broadcast television as a delivery system component in an area served by PBS stations in three states
- delivering videotape courses in areas with very few playback machines

### Observations About Distance Learning

- learners' preferences for educational delivery are in the following order: live instruction, packaged instruction mediated by a local faculty member, and, finally, totally remote independent instruction
- audio teleconferencing is well received as a means of augmenting videotape, audiotape, and other off-campus, technology-oriented delivery modes
- social motives are often as strong as intellectual ones for rural learners who get involved in learning at a distance
- rural adult learners do not prefer to be "lonely" or self-directed learners, preferring instead peer support groups, face-to-face encounters with faculty, and other interactive experiences
- the more practical or applicable course content is to local situation, the higher the participation rates

### Future Plans

- gain approval to serve as a community college for the six counties not currently part of an existing community college district
- offer additional two- and four-year external degrees
- increase faculty involvement in developing brokering programs for remote delivery
- equip each center with computer, video playback, and audio teleconferencing equipment

**Contact Person**

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self-generated revenues. The budget from all sources is $250,000 for 1981-82.

## Resources Available

None currently available, but the college is interested in sharing its experience and resources through one-to-one consultation and collaborations.

# EMORY UNIVERSITY SCHOOL OF MEDICINE

## Telecommunications Program

Emory Medical Television Network

### Educational Mission

The Emory Medical Television network offers continuing education to medical professionals in hospitals, clinics, medical schools, nursing schools, prison medical facilities, and private offices. In addition to live broadcasts to 32 client institutions in the Atlanta metropolitan area, the network leases and sells videotapes to thousands of clients nationally and internationally. Approximately 25 percent of network members are physicians in private practice.

### Telecommunications Technologies

The network distributes to live programming in the Atlanta area over a two-channel Instructional Television Fixed Services (ITFS) system. Video cassettes are used to serve clients in and beyond Atlanta.

### Curriculum

The network's curriculum is comprised of live programming conducted by the academic department of the Emory University School of Medicine, video replays of the live programs, and some medical programming produced by distributors of medical programming (e.g., drug companies). Each department in the medical school has a designated weekly time slot for its programming.

Decisions on the content of live programming are made by the academic departments. The associate dean for medical television determines what non-Emory productions will be included on the network. The emphasis in all of the programming is upon current developments in medical knowledge and practice. No print materials accompany the televised instruction. All live and taped programs meet the standard for two types of credit toward the Physician's Recognition Award of the American Medical Association when taken in accordance with AMA directions.

### Faculty Roles

Faculty of the Emory University School of Medicine decide what the content of programming offered by their respective departments will be. The actual on-camera instruction is conducted by one or more faculty members from Emory or other medical schools.

### Delivery System

The network broadcasts four hours per day, five days a week. Of the 20-hour broadcast schedule each week, 5 hours are given to new live programs; the remaining 15 hours are taken up by replays of the new live programming, replays of programming from previous weeks, and some programming from non-Emory sources. Each live program is replayed at least once during the week it is presented for the convenience of the clients.

Each program is one hour long. In most cases the medical professionals view the programming at convenient times during their work day. Any group discussions or classes that do occur are arranged by the client institutions. Over 12,000 video tapes are leased or sold each year for replay use by medical professionals all over the world.

### Enrollment

No enrollment figures are available. However, there are over 9,000 medical professionals employed in client institutions in the Atlanta area who have the opportunity to view the broadcast programming.

### Administrative Structure

The Emory Medical Television network is operated under the direction of the associate dean for medical television of the Emory University School of Medicine. The network is conducted in cooperation with the A. W. Calhoun Medical Library and Grady Memorial Hospital. It employs nine full-time employees.

The network began in 1967 and has benefited from two HEW grants from the National Medical Audio-Visual Center and the Regional Medical Program.

### Finances

Medical institutions that participate in the ITFS broadcast programming pay a yearly fee based upon the size of their organization. Institutions with over 125 beds pay $1,100 per year, and those with less than

### Noteworthy Features

- is the largest nonprofit national distributor of videotapes for continuing medical education
- uses both a regional (ITFS) and a national (videotape) delivery system to provide continuing medical education
- is able to provide extremely current medical information because of its live programming capacity over the regional ITFS network
- is a self-supporting program based on member institution fees and videotape sales and rentals

### Problems Encountered

- working within the constraints of a self-support budget that limits the ability of the network to acquire new and/or improved equipment
- handling the logistics of duplicating, inventorying, and distributing large numbers of videotapes
- obtaining viewer feedback about ITFS programming

### Observations About Distance Learning

- delivering instruction as conveniently as possible is of prime importance
- repeating programming at various times is essential if busy medical professionals are to participate
- allowing participants to copy programs on personal or organizational tape recorders greatly facilitates the learning process
- obtaining structured and open-ended feedback from videotape viewers greatly improves the ability of the network to improve its services

### Future Plans

- extend programming into more offices and homes of physicians by linking up with local cable company
- expand use of satellite downlink for participation in national and international medical education activities
- acquire a satellite uplink to facilitate closed-circuit broadcast of

programming nationally by linking with local cable companies

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125 beds pay $550. This fee includes access to the tape library. Organizations outside the range of the ITFS system get access to the tape library for $990 (over 125 beds) or $495 (under 125 beds). Thirty-two institutions participate in the ITFS system, and 160 pay the yearly fee for tapes. In addition, many thousands of individual tapes are leased or sold each year. Staffing and videotape are the two major expenses of the program. The overall budget figure for the network is not available. The network is currently a self-supporting entity.

## Resources Available

Catalog of Circulating Videotape Library, videotapes, Network History.

# INDIANA HIGHER EDUCATION TELECOMMUNICATION SYSTEM (IHETS)

## Educational Mission

In 1967 the Indiana legislature authorized the creation of Indiana Higher Education Telecommunication System (IHETS) as an independent consortium. Currently administered by Indiana University, IHETS has evolved into a "multi-purpose, multi-media, closed-circuit, statewide telecommunications system" which enables all postsecondary institutions in Indiana to share the same telecommunications resources. The IHETS mission is to operate communications networks that interconnect a wide range of educational centers for purposes of improving instruction, administration, interinstitutional cooperation, and networking among educators. Responsibility for programming resides with the individual colleges and universities.

The majority of IHETS activity involves services to educators and students on college and university campuses. A smaller, yet significant proportion of programming distributed by IHETS is aimed at learners who are not full-time students. They include employed professionals pursuing graduate credit or professional continuing education, including medical personnel, engineers, pharmacists, educators, and various governmental employees, as well as part-time adult learners seeking undergraduate credit while studying at home. In the latter group the average student is a female (70 percent), aged 30, who has in the past taken some college courses, is currently employed, and lives in a family making over $25,000 per year.

## Telecommunications Technologies

IHETS manages a video network and a telephone system called SUVON—the State Universities Voice Network. A statewide radio network has recently been discontinued. The video network is a statewide, closed-circuit system that uses a combination of ITFS, point-to-point microwave and cable television to link 109 locations in 26 Indiana cities. A specially designed audio talkback system called Teleresponse makes interactive (one-way video, two-way audio) transmission possible.

The entire network is controlled by a central computer capable of switching programming to and from different locations.

SUVON is a telephone network that connects all public universities, independent colleges and universities, and the Indiana vocational technical college regions. Using voice-grade circuits leased from telephone companies, SUVON provides both regular telephone and audio teleconferencing services. So far, little use of it has been made for instructional purposes; however, a conference bridge is in place for audio teleconferences.

IHETs staff, in cooperation with the Central Educational Network's (CEN) Postsecondary Education Council, is assisting Indiana colleges and universities that want to offer undergraduate television courses (telecourses) to learners in their homes via local public, commercial, or cable television outlets. Because the IHETS Video Network is a closed-circuit system it cannot reach learners' homes, but it is used to feed telecourses to participating institutions for faculty review and approval. In the 1980-81 academic year, 16 Indiana postsecondary institutions offered these telecourses for academic credit.

## Curriculum

Graduate and professional continuing education programming includes medicine, dentistry, nursing, pharmacy, engineering, speech and audiology, education, agriculture, and finance. Indiana University School of Medicine offers a range of live video and videotaped programs (not courses) to physicians and allied health professionals at 50 hospitals and clinics throughout the state. Most of this medical programming is conducted in live sessions by medical faculty and then made available for replay on videotape.

Another major user of the IHETS Video Network is Purdue University, which offers a wide variety of programming aimed at professionals. The School of Engineering's continuing engineering education program offers graduate credit courses and noncredit videotaped short courses to other college campuses and numerous industry sites. The School of Pharmacy and the Department of Speech and Audiology also offer credit and noncredit television programming. The Division of Independent Study offers credit

### Noteworthy Features

- has developed the only statewide telecommunications system used solely for higher education
- operates both video and telephone statewide interconnected telecommunications networks
- is a statewide consortium in which institutions pay no fees yet are able to participate as much or as little as they choose
- focuses most off-campus instructional activity on the continuing education needs of professionals
- manages technical aspects of the system and coordinates activities that support the academic programming, which is the responsibility of the colleges and universities

### Problems Encountered

- planning schedules in the face of competition among user institutions for the most popular programming time on the video network
- adjusting to the increasing costs of leasing transmission capacity during periods of level or declining funding
- getting some faculty at member institutions to understand what IHETS is and how to make use of its resources
- working with the decentralized public broadcasting system in Indiana
- managing a system in which the levels of participation by member institutions are quite uneven
- abandoning use of the IHETS statwide radio network for lack of use

### Observations About Distance Learning

- an increasing proportion of adult learners want the convenience offered by television courses delivered to the home
- regular on-campus classes may be most students' first preference, but work, home, and community responsibilities make television courses delivered at home an acceptable alternative

courses over the video network and noncredit materials in form of multi-media individualized instruction for professionals who prefer to continue their education in an independent study mode. These materials are distributed by mail to other colleges, government agencies, and professional associations.

The three telecourses leased by IHETS for statewide distribution over public, commercial, and cable television are introductory science courses produced by national distributors. By leasing these courses, IHETS makes it possible for Indiana institutions to offer them as regular distance learning credit courses or as on-campus enrichment resources for use by faculty in existing courses.

### Faculty Roles

Faculty are centrally involved in the design and delivery of all live interactive and videotape courses offered on the IHETS video network. Responsiblity for all aspects of the curricular content resides at the departmental level. Since much of the programming is done live, faculty interaction with students can take place during the programs as well as by phone, or face-to-face during scheduled office hours. Faculty at all IHETS institutions have the opportunity to review the video segments of prerecorded telecourses under consideration for leasing on a statewide basis. At those institutions offering telecourses for credit, local faculty support distance learners through telephone, mail, face-to-face meetings, and optional classes.

### Delivery System

The backbone of the IHETS delivery system for instructional purposes is the video network, which includes 109 college and university campuses and learning centers as well as public broadcasting stations, industrial sites, hospitals, public school systems, and community organizations in 26 Indiana cities. The interactive nature of the network, with its audio talkback system Teleresponse, diminishes somewhat the need for elaborate support services to facilitate student/faculty interaction. Similarly, the high motivation levels found among professionals pursuing continuing education preclude the need for many support services commonly found in undergraduate programs. The telecourses, which do reach undergraduates in their homes via public, commericial and cable television, are accompanied by a range of telephone, mail, face-to-face, and classroom contacts between faculty and students that vary from one institution to another.

### Enrollment

Participation in noncredit professional continuing education programming that is delivered to hospitals and other large organizations is not easily determined because there are so many potential viewers and viewing times and little incentive to keep records. Consequently, enrollment data are not available for many of these programs. The Division of Independent Study at Purdue University enrolled 2,600 students in 43 credit and noncredit professional continuing education courses for engineers, pharmacists, and audiology and speech specialists in the 1980-81 academic year. In its first year (1980-81) of offering telecourses to undergraduate students in their homes, IHETS institutions enrolled 179 learners in three courses at 16 institutions. In the fall 1981 semester alone, 567 enrollments were recorded for four telecourses by 16 institutions that offered the courses for credit.

### Administrative Structure

IHETS is administered by Indiana University on behalf of all the colleges and universities in Indiana (74 campuses and learning centers). The executive director of IHETS reports to the dean of learning resources, who in turn reports to the president of Indiana University. Representatives of various member institutions serve on the IHETS Advisory Council, the Committee on System Operations, the Committee on Programming, and numerous subcommittees. Each campus has a campus representative who serves as a communication link between IHETS and his or her institution.

IHETS central staff includes 19 full-time and 2 part-time employees. The staff's role is to serve as telecommunications managers of the video and telephone networks and to assist institutions that choose to use the system. The staff also conducts research, adapts and develops hardware, encourages networking among educators, and coordinates special projects such as the statewide leasing of telecourses.

### Finances

The overall budget of IHETS is approximately $2.5 million annually which is appropriated by the state legislature. Participating institutions pay no membership fees. The largest expenses include staff salaries, lease of telephone and television transmission capacity from various telephone companies, and equipment purchases and maintenance.

### Resources Available

IHETS Packet, TELELOG—program schedule for video network, Telephone Conferencing Users' Manual, Continuing Engineering Education newsletter (Purdue University), independent study course materials (Purdue University), program schedule for Indiana University Medical Television.

- the interest level of educational institutions in using telephone and video networks for instructional purposes varies greatly, even when there is no cost for use of a statewide system
- it is often difficult to get working professionals to take advantage of the interactive capacity of the video network

### Future Plans

- increase the number of institutions offering credit for telecourses
- explore the use of the SUVON teleconferencing systems for instructional purposes

### Contact Person

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# KANSAS REGENTS CONTINUING EDUCATION NETWORK—TELENET

### Noteworthy Features

- operates one of the largest and most active statewide audio teleconferencing systems in the United States
- offers live continuing education programming to many professional groups in Kansas
- operates on a self-supporting basis
- has the ability to connect anyone to the audio teleconferencing system who is within reach of a phone (e.g., a guest lecturer)

### Problems Encountered

- obtaining reliable maintenance and service from the phone company in the early years (service has improved as the system has grown)
- compensating for inadequate library facilities in some local settings, necessitating a substantial amount of materials duplication and distribution from the central office to the local sites
- convincing faculty that they could teach without establishing eye contact with their students; as more have done it, more are willing to try it
- working with some learners who contend they are "visual learners" and need to see the instructor to gain from the classroom experience
- facing the program's inability to serve those with substantial hearing difficulties

### Observations About Distance Learning

- the pace and nature of classroom activity should be changed every 12 to 15 minutes; lecturing for more than 15 minutes, for instance, is not effective
- students need time for a substantial break in the middle of a typical three-hour weekly session
- it helps to provide students with written materials to follow as the instructor is speaking
- the use of team teaching and guest lecturers can enliven the sessions by providing more variety

## Educational Mission

The TELENET network primarily offers noncredit courses, along with some credit courses, designed to update the skills and knowledge of a wide variety of professionals—including public school teachers, social workers, school counselors, and nurses. The average network participant is between 25 and 45 years of age and is more likely to be female than male.

The network also serves as a statewide communication vehicle and is used extensively for teleconferencing by a variety of organizations. During the summer, the cooperative extension program staff use it to broadcast crop reports and bulletins (called "Telecrop").

## Telecommunications Technologies

TELENET is an audio conferencing communication system that uses a four-wire dedicated telephone network leased from the telephone company to link many locations in the state to a single communication system. Each TELENET classroom provides two-way communication between students and the course instructor, using press-to-activate microphones and a public address system.

## Curriculum

Many courses are specifically designed to meet continuing education requirements mandated by the state, or needs of specific professional and technical groups such as teachers, nurses, food-service workers, etc. Other courses are designed to respond to personal growth and special-topic concerns of adults. Graduate-credit enrollment outnumbers undergraduate enrollment by over two to one. Many TELENET courses are available for either graduate or undergraduate credit. In 1980-81, TELENET offered 42 different courses, 32 for credit and 10 not-for-credit, which represented 1,331 hours of programming.

All six of the Regents institutions, the state universities, contribute to TELENET programming. Since each institution sponsors at least one program not available at the other institutions (e.g., library science, home economics), courses in these programs are prime candidates for TELENET and can increase access to particular curricular offerings statewide. The central TELENET office serves as a clearinghouse for the collection and distribution of supplementary materials (e.g., textbooks, special handouts). Each of the six state universities is individually responsible for developing and offering its own TELENET courses. The continuing education division on each campus identifies courses to be offered, based on its own perception of state needs. By joint agreement, each institution accepts credit for TELENET courses sponsored by each of its five sister institutions.

## Faculty Roles

Central TELENET staff, located at Kansas State University, provide an orientation program for faculty who have not previously taught via TELENET and who may be inexperienced with the use of the microphone. Paid monitors are assigned to each TELENET classroom and assist with materials distribution, the use of microphones, and exam and assignment collection, as well as with the presentation of special slide, overhead, or blackboard displays and graphics. TELENET instructors are encouraged to visit the different network sites during the term, as their schedules permit, and to maintain established telephone office hours. Some faculty maintain office hours via a toll-free number. Faculty offer TELENET courses as part of their regular teaching load. Sometimes, however, the university will provide extra funds for supplies, graders, and travel expenses. As more and more faculty members participate in TELENET and see that it is effective, faculty recruitment has become much less difficult.

## Delivery System

TELENET links together by phone line 34 specially equipped classrooms throughout the state. Sites include public libraries, community colleges, community resource centers, area vocational/technical schools, high schools, and adult education centers, in addition to the six state university sites. Each site is supervised by a TELENET coordinator who assists with space scheduling, course publicizing, and other course logistics.

The two-way communication system allows for interaction between faculty and students located in any one of the sites. The faculty member can initiate the course from any one of the special classrooms. Guest lecturers or special resource faculty can communicate over the system via long distance from any place in the United States or abroad—from any place there is a telephone. Recently, 17 social rehabilitation service offices joined TELENET and are using the special classrooms to conduct statewide meetings. Also, 12 to 15 high schools are using the system for a high school enrichment program.

Prime time hours for TELENET courses are 4 p.m. to 10 p.m. Mondays through Thursdays, and 9 a.m. to 12 noon on Saturdays, a total of 1200 programming hours during the regular academic year.

## Enrollment

Enrollment has continued to grow gradually since TELENET began in 1970. In 1980-81, including summer, credit enrollment reached 3,047, with about two-thirds of the students enrolled for graduate credit. More than 7,000 individuals used the system (including noncredit course enrollees and those in high schools and social service agencies). Enrollment figures are based on the number of students completing the courses. Course completion rates are high; of those who decide to remain in the course and pay their tuition (due before the third class session), only about 2 to 3 percent fail to complete the course.

## Administrative Structure

The network is operated by the six Regents institutions and administered from a central office located in the Division of Continuing Education at Kansas State University. The Council of Deans and Directors of Continuing Education of the Regents institutions, an inter-institutional council, is responsible for determining overall network policy and budget. Central staff includes a full-time director, a full-time person to monitor and supervise the broadcasts and coordinate the distribution and collection of printed materials, a full-time office manager/secretary, and one or two half-time student assistants. A new full-time assistant director was hired in the summer of 1981.

## Finances

TELENET is self-supporting and relies on three major sources of revenue: an annual fee paid by each Regents institution (for 1980-81, this amounted to $17,000 per school); a portion of the tuition payment ($10 to $15 is added to the basic tuition fee and is reimbursable to TELENET to pay for postage and materials duplications); and revenue from the sale of non-prime time used by other groups such as the high schools, rehabilitation agencies, medical technologists, etc. The fiscal 1982 operating budget level was $170,000. Expenses are fairly equally divided among administrative salaries, telephone leasing, classroom monitor wages, and office expenses. Contributed time includes use and maintenance of TELENET classrooms by many different local agencies and the time spent by local site coordinators who hire and supervise the classroom monitors.

## Resources Available

*Kansas Regents TELENET*, a promotional brochure; and brochures describing term course offerings, TELENET locations, and registration procedures.

- keeping the students actively involved in network discussion and off-network activities is of critical importance
- adult learners are highly motivated

### Future Plans

- increase the use of video cassettes and film along with the teleconferencing
- explore linkage with television productions of the University of Mid-America, using TELENET for follow-up discussions
- expand use of TELENET by state agencies and organizations, including use at worksites
- offer more noncredit professional continuing education courses
- explore the possibility of segmenting so that select network sites can present more than one program at the same time

### Contact Person

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# KENTUCKY COUNCIL ON HIGHER EDUCATION

### Noteworthy Features

- is a statewide consortium that includes all community colleges, public universities, and independent colleges in Kentucky
- publicizes consortium courses to businesses, unions, prisons, senior citizen agencies, etc.
- provides member institutions with consortial services and broadcast television time, using funds appropriated by the state legislature rather than funds from membership fees
- makes special efforts to provide faculty and support staff with training
- conducts ongoing research on telecourse students
- encourages innovative delivery systems by offering funding to member institutions through a competitive grant process
- has a close working relationship with Kentucky Educational Television
- experiments with the integration of telecourses and live presentations by local faculty before and after video segments are aired on cable television

### Problems Encountered

- spending the extensive periods of time required for decision making in an organization that involves so many institutions
- undertaking efforts to cooperate with cable television operators for program delivery when there are over 300 cable companies in Kentucky
- working within the limited amount of air time available on KET, which constrains the ability of the consortium to expand its course offerings
- overcoming the lack of familiarity among many faculty with the scheduling realities facing broadcasters and adult distance learners

### Observations About Distance Learning

- adult learners are very lively, and faculty find them exciting to teach

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## Telecommunications Program

Telecommunications Consortium

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### Educational Mission

The Telecommunications Consortium, which includes all public and independent colleges and universities in Kentucky, was formed in 1978 to provide undergraduate and graduate college credit television courses to Kentucky residents who are unable to attend classes on a college campus and to provide continuing education programming for groups of professionals. In all cases the television programming is broadcast statewide by Kentucky Educational Television (KET).

The consortium supports its member institutions by providing services that are more easily accomplished on a statewide basis (e.g., publicizing courses, leasing telecourses, and conducting research and faculty workshops). One of the consortium's functions has been to fund seven demonstration projects using a competitive mini-grant process as a way of encouraging innovation.

Most of the students served by the undergraduate television courses are in their mid-thirties; 65 to 70 percent are female, the vast majority are white, and they come from a wide range of rural and urban communities. Fewer than 30 percent are concurrently enrolled in one or more on-campus courses.

### Telecommunications Technologies

The Telecommunications Consortium uses public broadcast television as its primary delivery technology. Some consortium member institutions have access to cable television in their communities. Telephones are used extensively for interaction between faculty and students. By combining open broadcast television and telephone, the consortium conducts video teleconferences for some professional continuing education programming.

### Curriculum

The majority of consortium courses are introductory undergraduate courses in the social sciences, humanities, and sciences. At least one graduate-level telecourse is broadcast each semester. Most television courses, or telecourses, are leased from national producers or through PBS/PTV-3. A few are produced by individual consortium-member institutions or by Kentucky Educational Television (e.g., GED). The consortium offers an average of ten telecourses per year (four to five per semester). The consortium has experimented with graduate courses in engineering and pharmacy, as well as professional continuing education teleconferencing in pharmacy, law, engineering, library science, nursing, and realty.

### Faculty Roles

The nature of faculty participation in the development and delivery of courses is determined almost exclusively by the individual institutions. The consortium offers workshops for faculty, librarians, counselors, and financial aid officers involved in the delivery of telecourses at member institutions. Consortium staff find this type of technical assistance to institutional personnel has a positive effect on the quality of services provided to students. Consortium staff also encourage the development of informal networks among faculty teaching the same telecourses at all institutions in the state.

### Delivery System

The television programming is all offered over KET (Kentucky Educational Television). Although practices differ from institution to institution, students can interact with faculty by telephone or in person during office hours or during on-campus testing and review sessions. Students are able to review programs during repeat broadcasts on KET and on videotapes at their institutions. Some institutions (e.g. Paducah Community College, Kentuckiana Metroversity, and University of Kentucky), able to offer courses over local cable channels, can have the local instructor discuss the telecourse before and after the video taped segment is aired.

### Enrollment

In the 1980-81 academic year there were 1,422 enrollments in consortium telecourses. Enrollments are recorded as of the second week of the semester. Information on the completion rate for students is not collected on any courses by the Council on Higher Education; therefore, the completion rate for telecourses is not available.

## Administrative Structure

The consortium is composed of 41 public and independent institutions. Of these, in the spring of 1981, 21 actually participated in consortium activities. The Telecommunications Consortium was created by the Council on Higher Education, and its activities are funded by the Kentucky legislature. Even though each institution is represented directly or indirectly in the governance of the consortium, it operates on a relatively informal basis. Participation by the institutions is voluntary. One of the consortium's primary activities is to select a range of course offerings that satisfies the needs of the community college, public university, and independent college communities in the state. The consortium is staffed by a full-time coordinator, a half-time assistant, and a half-time secretary.

## Finances

The state appropriation for the activities of the consortium was $211,000 in fiscal year 1981. Major expenses include telecourse leases, per-student fees to telecourse producers, promotion, and research. Member institutions receive the services of the consortium without paying any membership dues. KET provides air time free of charge to the consortium. KET is state-funded and considers formal education programs part of its mission.

## Resources Available

Brochures, research reports, information about courses produced by consortium member institutions.

- when starting a telecommunications program, it is best to start small and select courses likely to be popular with students and faculty
- faculty must be familiar with the needs of adult learners before participating in television courses
- it is possible to obtain a high level of cooperation among diverse educational institutions

## Future Plans

- expand the use of cable television and encourage experimentation by local institutions
- increase emphasis on professional continuing education
- produce consortium-sponsored telecourses
- use open-broadcast educational television channel if KET gets a second channel

## Contact Person

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# KIRKWOOD COMMUNITY COLLEGE

## Telecommunications Program

Kirkwood Telecommunications System (KTS)

### Educational Mission

The educational mission of Kirkwood Community College is to provide educational opportunities to learners throughout a seven-county service district. The Kirkwood Telecommunication System provides the means for extending these opportunities to persons in remote locations who might not otherwise attend classes on campus. The system was designed to serve distant learners and to better serve the needs of the main campus. The college offers lower-division liberal arts and vocational/technical courses, professional continuing education programs, and general-interest offerings. The majority of learners are working adults between the ages of 25-30, (60 percent) are women. Student enrollments fall into three fairly equal-sized groups on-campus students, off-campus students, off-campus learners at the four remote locations, and inmates at the Iowa State Men's Reformatory, served by one channel of ITFS broadcast television.

### Telecommunications Technologies

Included within the Kirkwood Telecommunication System are four interactive television links with two-way video and audio; four channels of cable television in the Cedar Rapids cable network; a 36-channel, on-campus, closed-circuit distribution system; and a public broadcast FM radio station. Although most of the programming carried on the two-way video and broadcast ITFS systems is live, the college is using some prerecorded television and radio courses produced externally.

#### Telelink

The Kirkwood Telecommunications System (KTS) uses a Telelink network. *Telelink* is a term used to refer to a two-way, interactive, point-to-point microwave network. This technology permits two-way video and two-way audio transmission between the campus and remote locations throughout the seven-county district. Currently, four Telelink sites are operational; and by the fall of 1982 there will be three additional sites added to the network. Nearly all programming is live. These programs can originate from the two specially equipped classrooms on campus, or faculty can originate them from any of the similarly equipped remote sites. This permits faculty to meet periodically with students at each remote location. Each classroom is equipped with two cameras—one in the back of the classroom and a fixed camera in the front of the room. Generally, only one camera person is required for each class, operating in the back of the classroom. This camera person can activate the remote-location cameras when the instructor wishes to respond to questions or comments from distance learners.

One unique aspect of the Telelink system is the option of changing the configuration of the network from two to five sites. If there is a need to offer a course to only one distant site, the system can be configured to accommodate this need and can still offer another course at the same time to other locations. This feature also is useful when an instructor teaching to several locations wishes to form small-group discussion sessions between specific sites. The system can be reconfigured during this period and then all sites can be brought together at the appointed time.

Students at all Telelink locations can see the instructor in the originating classroom. When a student wishes to talk, he or she simply activates a press-to-talk audio device, which permits the comments to be heard throughout the network. Simultaneously, the camera operator will activate the camera at the front of that remote classroom, allowing students not only to hear the comment, but also to see the student.

#### Instructional Television Fixed Service (ITFS)

In addition to the two-way Telelink system, the Kirkwood Telecommunication System also has four channels of one-way television with two-way audio. This broadcast system can be programmed either separately from or together with the Telelink system. Unlike the point-to-point microwave system, ITFS is a broadcast system that can be received anywhere within the range of the signal. Currently, one channel of ITFS is being used to serve the needs of the Iowa State Men's Reformatory in Anamosa. This reformatory has over 900 inmates who are receiving a wide range of college credit and vocational programming. The majority of their programming is simultaneously being transmitted on the Telelink system, but, when necessary, separate programming needs are being met. When the ITFS is fully operational in 1982, the system will provide programming to public schools, business and industry, and other locations throughout the district.

### Cable Television

Kirkwood is currently involved in two channels of cable television within the Cedar Rapids and Marion cable system. The college has been provided one channel of its own to program. Included are live college credit courses, broadcasts of prerecorded college credit courses, public service announcements (including information related to college offerings), various films, and specialized programs. The college provides the coordination and origination of programming for a second cable channel for the Educational Telecommunications Consortium, composed of 11 agencies within the area.

## Curriculum

Kirkwood Community College uses telecommunications to offer residents of its seven-county district lower-division liberal arts and vocational/technical courses, as well as professional continuing education and general-interest programming. Liberal arts courses include a wide range of humanities, social science, and science subjects. The vocational/technical curriculum includes nursing, business, and agriculture. The professional continuing education programming serves professionals in the fields of nursing, agriculture, and energy, among others. Of KTC courses, 75 percent are offered for credit, and 25 percent (continuing education and general interest) are noncredit.

With the assistance of a grant from the Fund for the Improvement of Postsecondary Education (FIPSE), KTC has been able to develop several courses that have laboratory components or other unique aspects to offer over the Telelink network. By using resources such as circuit-riding faculty and teacher aides, local site laboratories, special support from the camera operators, and Kirkwood on-campus laboratories, the Office of Non-Traditional Studies has been able to offer lab experiences to students in courses such as English composition, interpersonal communication, human anatomy and physiology, and physical assessment. These courses all have been taught in live, interactive format.

## Faculty Roles

Live, interactive television allows faculty to exercise a great deal of control over the design and delivery of their courses. However, each faculty member needs to carefully analyze his or her course in terms of how it relates to the television media and then make necessary modifications to ensure a successful program.

Some instructors take great pains to use the interactive capacity to its fullest and to humanize the system by employing some of the following approaches: originating the program from the remote locations, developing a poster of student pictures and names to more quickly connect names and faces, directing questions to remote-site learners by name, and encouraging discussions among students at a single remote site or reconfiguring the Telelink system to enable two or three remote sites to have discussions with each other.

KTC staff make a number of special efforts to orient faculty to the system and to improve their effectiveness in using it. Faculty using the Telelink network are given a technical orientation to the system, along with assistance in adapting their course to it. Staff encourage faculty to practice using the system before their first class, and a staff member is present to assist during the first class. Peer support is facilitated by linking experienced faculty with those who are new to the system. A faculty handbook is being developed to provide additional assistance.

## Delivery System

Students can take prerecorded television courses over local educational cable channels or live, interactive courses at any of the five Telelink sites (four remote and one on-

### Noteworthy Features

- operates a two-way video and audio system that offers 60 hours a week of live, interactive television programming
- offers live, interactive courses to students taking lower-division undergraduate as well as professional continuing education courses
- offers both live, interactive courses and prerecorded television courses to distance learners
- operates a live, interactive network that gives faculty total responsiblity for developing the content and style of courses; a practice that is not possible for television courses leased from national distributors
- provides extensive logistical support for learners at remote learning sites
- incorporates laboratory sessions into live, interactive television courses that serve remote sites
- operates a live, interactive system that permits origination from any site and that can be configured to permit simultaneous discussions among two or more remote sites
- enjoys strong support from the college president for its use of telecommunications to serve learners on and off campus.

### Problems Encountered

- devising an administrative system capable of managing all the details necessary to serve learners both on and off campus
- getting faculty members accustomed to the lead time needed to plan delivery of education using telecommunications
- acquiring sufficient hardware to implement a well-designed interactive educational network

### Observations About Distance Learning

- the quality of the instruction is by far the most crucial variable in an educational delivery system
- it is necessary to have a central location responsible for coordinating all the details associated

with delivering education off campus

- technical difficulties will occur, even with the most well-designed system
- effort invested in improving the ability of faculty to adapt to the technology is time well spent

### Future Plans

- complete the implementation of an ITFS system serving a prison, public schools, industry, and, possibly, health facilities
- develop a curriculum to serve business and industry educational needs
- transmit and receive programming via satellite

### Contact Persons

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campus). Each remote site is staffed by a part-time local coordinator who handles logistics and assists students in use of the two-way video system, thus easing the faculty members' logistical concerns. Students taking courses at the remote sites on the Telelink network are assisted by this local coordinator in how to use the push-to-talk microphones, how to register, and how print materials and correspondence are transported to and from the remote site.

In addition to faculty and teacher aides who sometimes circuit-ride from one remote site to another, students benefit from the services of an outreach counselor. This counselor initiates calls to students and offers assistance with career planning, courses selection, and even transportation, baby-sitting, and job problems. Students also can call toll-free telephone numbers to register for classes or to talk to faculty.

## Enrollment

During 1980-81, when audio teleconferencing system TELENETWORK was still in use, Kirkwood enrolled over 2,000 students in credit and noncredit courses. In the fall of 1981 there were 520 enrolled in interactive Telelinks credit courses. In addition, 156 were enrolled in prerecorded television courses offered over cable. Since Kirkwood is on the quarter system, the enrollment figure for the entire 1981-82 academic year is likely to be approximately 2,000. Data on completion rates are not available.

## Administrative Structure

The Kirkwood Telecommunications System is administered by the Office of Telecommunications whose dean reports directly to the president, and by the Office of Non-Traditional Studies, whose director reports to the vice president for instruction. The former office manages all technical aspects of the system, and the latter is responsible for programmatic and instructional dimensions.

Within the Office of Telecommunications there are five full-time and 4 part-time employees who are directly involved with KTS. In the Office of Non-Traditional Studies there are four full-time and three part-time employees involved in the support of the Kirkwood Telecommunications System.

## Finances

Support for KTS comes from a combination of budgeted college funds and federal grants. In addition to college funds, Kirkwood Community College has received grants from NTIA, FIPSE, and Title III to expand and/or improve various aspects of KTS. Major expenses include staff salaries, support for those regular faculty teaching KTS courses on an overload basis, and the maintenance and depreciation of equipment. An overall annual budget figure for KTS is not available.

## Resources Available

Faculty handbook, brochures, newspaper articles.

# LOS ANGELES COMMUNITY COLLEGE DISTRICT

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## Telecommunications Program

Instructional Television (I.T.)

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### Educational Mission

The Instructional Television (I.T.) program offers college credit courses primarily to working adults whose schedules do not permit them to come to campus regularly for their education. Over 70 percent of the I.T. program's students are not concurrently enrolled in any on-campus classes. In fact, many see the program as a low-threat opportunity to try out college courses for the first time. Of I.T. students, 80 percent work more than 80 hours per month. The students' ages range from 16 to over 65; their average age, however, is 39, roughly 10 years older than the average age of on-campus students in the Los Angeles Community College District. The male/female ratio of I.T. students is approximately the same as that found on the campuses. However, in spite of considerable ethnic diversity, there is a smaller proportion of minority students in the program than on the campuses. All students of the Los Angeles County Community College District attend on a tuition-free basis, which enables the college to serve many learners who could not otherwise afford to attend.

### Telecommunications Technologies

The I.T. program uses primarily public broadcast television to serve its students. Cable television is used on a supplementary basis, and telephones are used extensively in faculty-student interaction.

### Curriculum

Most of the courses offered by the I.T. program are in liberal arts and business. The I.T. program has produced five of its own courses, but the majority of the 12 courses offered in 1979-80 were acquired from other national distributors. Recent curricular production efforts at I.T. have focused on a history of Mexico, a series on contemporary Japan, and a course on Americans of Japanese descent.

### Faculty Roles

Los Angeles Community College District faculty play a central role in every phase of the I.T. program's activities. Not only are the operations and production components headed by discipline-based faculty members, but all decisions regarding selection of television courses, faculty, video and print components, and the establishment of minimum course requirements are made by districtwide committees of faculty from the relevant disciplines. (Courses developed by the I.T. program may be designed and produced by an individual or a team of faculty members, depending on the subject of the course and the range of skills of the lead faculty person.) Each course offered by the I.T. program has one faculty advisor who is assigned responsibility for all students on a full-time basis for that semester. Because of the heavy involvement of their peers in the program, faculty who accept this responsibility have the definite feeling that they have been selected rather than designated.

### Delivery System

Most courses include three separate television segments per week, which are rebroadcast for student convenience. Videotapes are available also for viewing on campus. In addition to two required tests, which are offered at three of the nine district campuses, I.T. students have available two-hour weekend classes on campus. These optional classes include an orientation session, midterm, preview, final preview, and two make-up sessions. The responsible faculty member conducts these sessions four times per weekend, divided among three campuses, for the convenience of the students. In addition, faculty meet personally with incarcerated students and other groups that request assistance. Faculty maintain office hours for the equivalent of three full working days per week during the daytime and evenings for telephone and personal assistance. Approximately two-thirds of the faculty offer their students course-related experiential learning options, such as theater, concert performances, or field trips. (Field trips may be to local businesses, or the stock exchange, or on a research boat, as appropriate.)

### Noteworthy Features

- operates a program in which college faculty have oversight over almost all administrative and curricular decisions
- delivers television courses to a large number of working adult learners (approximately 7,000 enrollments per year)
- places special emphasis on equal academic standards and services for television and traditional courses

### Problems Encountered

- making and maintaining contact with students
- managing the process of distributing books to I.T. students (possible solution outside commercial services)
- balancing the benefits of active faculty involvement in all phases of the program with the managerial liabilities inherent in academic democracy
- overcoming resistance from uninvolved faculty to the program's efforts to experiment with new curricular areas and pedagogical approaches

### Observations About Distance Learning

- it is important to maintain objective, faculty-based oversight of the program as a way of ensuring a high-quality approach to distance learning
- the perspectives of distance learners who normally do not participate in the educational mainstream offer rare insights into the effects of the college experience on individuals

### Future Plans

- make use of cable television to increase the program's ability to match programming more closely to students' needs
- offer learners more detailed written feedback on tests by using a word processor/microprocessor

### Contact Persons

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or

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### Enrollment

In the 1981-82 initial enrollment in I.T. courses was approximately 6,500 (including summer school). Since many students enroll in more than one class, the actual number of students is about two-thirds this figure. The average class size is 540. The completion rate, which is over 40 percent, is, in part, a reflection of the free tuition, which makes it easy to sign up and then drop courses.

### Administrative Structure

Instructional Television is composed of operations and production units, both part of the districtwide Office of Instructional Service. The operations staff includes five full-time teaching faculty positions, one management faculty, and six classified personnel.

### Finances

Since the college is tuition free (students pay for their books and supplies), the program's support comes from state average daily attendance (ADA) funds. Major expenses of the program include staff salaries, telephones, postage, and fees for membership in the Southern California Consortium of Community College Television. The operations budget is $250,000, and the production budget varies from $70,000 to $150,000 per year. Approximately $100,000 from the budgets of other parts of the college also contribute to the program's activities.

### Resources Available

*Television Courses:*
History of Mexico
Inside Japan
Japanese in America

# MARYLAND CENTER FOR PUBLIC BROADCASTING

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**Telecommunications Program**
Maryland College of the Air

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## Educational Mission

The Maryland College of the Air, which began in 1971, is a cooperative venture between the Maryland Center for Public Broadcasting and 19 two- and four-year colleges and universities in Maryland. Its purpose is to combine the resources of the Maryland Center and the colleges to provide cost-effective delivery of prerecorded television courses to individuals who prefer the convenience of learning at home. Because the Maryland College of the Air is an informal cooperative arrangement rather than a legal consortium, all responsibility for overall administration resides with the staff of the Maryland Center.

The range of learners served by the 19 participating institutions is very broad. Most students are in their thirties, approximately 60 percent are women, and most have had some previous college experience. The percentage of students who are concurrently enrolled in on-campus classes as well as in Maryland College of the Air classes varies from zero to about 40. A small number of incarcerated students are served by participating institutions.

## Telecommunications Technology

The Maryland College of the Air uses the public broadcast television resources of the Maryland Center for Public Braodcasting, as well as some local cable companies, to air its courses. Telephones are used extensively for student/faculty interaction.

## Curriculum

College of the Air programming includes lower-division social science, humanities, and science courses, which are either produced by the Maryland Center or leased from national distributors. Over the years the Maryland Center has produced nine courses, but currently is not producing any for use by the College of the Air. Courses produced by the Maryland Center usually involve a single faculty author or a faculty team working in cooperation with a technical production unit. Print materials include commercially available textbooks and study guides that are written by the institution or agency that produces the course (e.g., Maryland Center, Miami-Dade Community College).

## Faculty Roles

Faculty are involved in course production and delivery. Normally, when a new course is under consideration for production, a committee of faculty content experts from participating colleges will develop a short course outline, which is then turned over to a single faculty member or team of faculty who work with production staff from the Maryland Center. Faculty at participating colleges that manage telecourses interact with students by mail, telephone, and in person. They also offer optional seminars prior to examinations.

## Delivery Systems

The configuration of support services available to learners varies from one college to another, but they generally include telephone, mail, and personal contact with faculty and staff as well as optional seminars and proctored exams. Maryland Center staff handle all administrative details relating to activities such as scheduling open broadcast television air time, providing videotapes for cable operators, and ordering and distributing texts and study guides. At the Maryland Center special emphasis is placed on careful planning and attention to detail in order to ensure the smooth operation of the College of the Air.

## Enrollment

Enrollment in telecourses at College of the Air institutions during the 1980-81 academic year totalled 1,589. Enrollments for the fall of 1981 were 1,079. These figures are based on the number of students registered in the fourth week of classes. Although the completion rate varies from institution to institution, the average is approximately 50 percent.

## Administrative Structure

The Maryland Center for Public Broadcasting is the lead organization in what is a very informal cooperative arrangement. There is

### Noteworthy Features

- operates an informal educational consortium under the leadership of a state public broadcasting center
- operates informally, without binding legal arrangements
- includes 5 four-year and 14 two-year colleges in a cooperative statewide effort

### Problems Encountered

- working within the limits imposed by the lack of available television-based courses
- overcoming faculty resistance to telecommunications and distance education
- acquiring and distributing student books
- managing the program in the face of varying degrees of faculty commitment to teaching telecourses

### Observations About Distance Learning

- it is important to make administrative procedures as simple as possible
- courses that are less costly to produce often do as well as or better than, very expensive productions in terms of student enrollment
- without further experimentation with alternative formats, budget levels, and distribution technologies, the number of telecourses able to attract sufficient numbers of students to be clearly cost-effective is likely to remain small

### Future Plans

- expand the use of cable television as more cable capacity becomes available in the area
- experiment with the production of lower-cost television courses

### Contact Person

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no formal written agreement other than normal correspondence confirming the level of participation by institutions each semester. Colleges can choose to offer any, all, or none of the five to six courses offered each semester.

Colleges pay no annual fee; they do pay the Maryland Center $23 for each student enrolled in a telecourse. This way the center absorbs the overhead, and the colleges can afford to enroll small or large numbers of students. The Maryland Center handles all administrative arrangements related to course production, acquisition, and broadcast as well as acquisition and distribution of textbooks and study guides and overall coordination.

The College of the Air is staffed by an experienced Maryland Center professional assigned for one-third of his time plus one secretary.

## Finances

The overall appropriated budget for the Maryland College of the Air amounts to $80,000 per year (not including the salaries of the director and secretary). This figure also does not include per-student fees paid by the colleges, which go into a general Maryland Center fund. Major expenses include course production, course acquisition (leasing and per student fees), open broadcast air time, and salaries.

## Resources Available

Current course brochure
*Courses:*
Introduction to Philosophy
From Science to Sartre
Introduction to Geography
Of Earth and Man
Introduction to Mathematics

# MEDICAL CARE DEVELOPMENT, INC.

## Telecommunications Programs

Central Maine Interactive Telecommunications System (CMITS) and the Aroostook County Telecommunications System (ACTS)

## Educational Mission

The purpose of the Central Maine Interactive Telecommunications System and Aroostook County Telecommunications System is to use interactive video technology to cost-effectively serve the continuing educational needs of practicing medical professionals at medical facilities in two rural regions of Maine. By combining expertise available at the seven member organizations (five hospitals, a family practice residency program, and the University of Maine at Augusta), CMITS is able cooperatively to develop educational programs in which no institution either receives or transmits all network programming. In this consortium, all member organizations share in the development and implementation of network programming, thereby contributing to the goal of an "educational balance of payments." The same is true for the five hospitals that form the Aroostook County Telecommunications System.

CMITS and ACTS provide educational programming to all levels of management including groups such as administrators, doctors, social workers, dietitians, nurses, and physical plant staff. In addition, the CMITS network serves individuals from related organizations in the community who come to one of the participating sites to take courses. This group constitutes about 5 percent of those served by CMITS.

## Telecommunications Technologies

CMITS uses point-to-point microwave to provide two-way video and two-way audio educational programming for an average of 27 hours each week. All transmission signals converge in Augusta, where they are distributed to the appropriate participating sites. All seven participating sites are similarly equipped, so that programs can be initiated from any of them.

The originating site sets up an interactive class or meeting by pressing a button on a console for each site to be included. Up to three two-way television sessions can take place simultaneously; a single session can include all sites. The originating site is the image seen by participants at the other sites at all times, except when someone from another site speaks (by pushing a bar on a press-to-talk microphone). When this happens, the video image switches from the originating site to the speaker's site.

Some sites have special rooms furnished with the equipment, and others use a mobile cart to transport equipment to rooms that are wired for it. The digital logic system is designed to accomplish the switching among sites without the presence of an engineer.

During the summer of 1981, Medical Care Development, Inc. began full operation of a slow-scan television system, which is used by five hospitals in Aroostook County, over 300 miles to the north of the area served by CMITS. Use of this technology allows the Aroostook organizations to communicate among themselves and with CMITS sites. Using this slow-scan technology, the ACTS organizations are able to convert moving images into still pictures and then transmit the visual material among themselves via telephone lines, which are much less expensive than regular broadband video transmission. The time between frames can be varied from 8 to 17 to 35 seconds. This is currently the only known example of an interface between broadband two-way video and slow-scan video technologies for educational purposes.

## Curriculum

Most of the CMITS programming is noncredit professional continuing education that is planned, produced, implemented, and evaluated by user groups made up of members of specific professions or content specialties at one site or from all of the participating sites. Participants include nurses, medical records staff, medical technologists, directors of social work, critical care staff, etc. Some examples of subjects are management, nursing leadership, and communications skills.

The two to four credit courses offered each semester by the University of Maine at Augusta occupy about 10 percent of the

### Noteworthy Features

- uses a two-way, interactive television network to serve the educational needs of medical professionals in rural Maine
- uses slow-scan television on a two-way, interactive mode to link five hospitals in rural Maine to provide continuing education for medical professionals
- operates a user-oriented television system on which the programming is planned, implemented, and evaluated by professionals organized into user groups
- operates a communication system in which the information flow is not from center to periphery, but roughly equal (creating an "educational balance of payments") among all participating medical organizations
- enables health facilities to share human and material resources in a cost-effective manner
- enables health facilities in a rural area to access educational resources in other parts of the world by linking up with other medical facilities equipped with slow-scan television
- operates a communications system that interfaces broadband interactive video with slow-scan interactive video

### Problems Encountered

- developing strategies to gain support for the implementation of the video system from the various levels of medical professionals at the hospitals
- adapting the technology to give each facility identical capability to originate programming and to determine which other sites receive its programs.
- devising a two-way video system that minimizes the need for technicians and operators for most types of programming
- working out initial technical difficulties in making the bridging aspects of the slow-scan video system operational
- finding accurate information about the direct and indirect costs of traditional education in

order to make cost comparisions with the CMITS approach.

- building depreciation costs for equipment into the annual budget

### Observations About Distance Learning

- professionals in rural areas have considerable expertise, and unless an educational delivery system allows them to originate as well as receive programming they are likely to resent and resist it
- two-way interactive video is especially appropriate for adults in rural areas because the social interaction of both visual and aural feedback is highly valued
- adult learners who are given the opportunity to participate in the planning, development, delivery, and evaluation of their learning experiences gain a heightened sense of self-worth from the experience
- it is possible to teach professionals from fields other than education how to create and evaluate their own educational programming
- advocacy for a communication system like CMITS or ACTS is most effective when it comes from professionals to their peers rather than from educators
- slow-scan video is the most cost-effective means of delivering interactive video to rural areas

### Future Plans

- expand the system to serve a larger region within Maine
- exchange programming with other medical education networks throughout the country
- expand programming to different clientele

### Contact Person

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system's time. Credit courses include subjects such as clinical pharmacology, anatomy and physiology, nutrition, methods of applied mathematics, and communication psychology. A course may be taught by a lead instructor from one of the organizations, but it also will draw on content experts at the participating sites. Decisions on which credit courses are needed are made by the directors of education in the hospitals. Other system uses include grand rounds, professional association meetings, team meetings, and interdisciplinary seminars. The same procedure has been developed for programming in Aroostook. Credit courses have not yet begun but are planned. Some of the programming is shared between the two systems.

### Faculty Roles

The term faculty really is only appropriate for the credit courses, and even here there may be content experts from one or more of the participating sites contributing to the course presentations. CMITS is a user-oriented system based on the conviction that information in a network should not flow in one direction from a central source of knowledge to largely passive receive-sites. Rather, it should be an interactive process that draws the expertise of resident experts and participants at all the sites. The designers of CMITS felt this was particularly important in a rural area when the organizations are of similar size, each with their own strengths and weaknesses.

### Delivery System

Each participating organization has one or more individuals who serve as liason with the system. Their role includes training potential users in the operation of equipment, assisting in the development of programming, and providing feedback to telecommunications staff concerning the needs and preferences of their particular hospital.

For those unfamiliar with either system, orientation is provided in face-to-face meetings with individuals and groups as well as on the system itself. A *User Guide* is given to new students and program presenters to acquaint them with the characteristics of the interactive video system.

Users of the system are able to influence its content and operation by means of various input mechanisms, including user groups, evaluation forms filled out at the end of each session offered over the system, and responses to periodic needs assessment surveys conducted by the telecommunications staff in conjunction with the hospitals.

### Enrollment

Approximately 200 professionals enrolled in credit courses on the CMITS network in the 1980-81 academic year, with a completion rate of almost 100 percent. If an attendee is defined as one person attending one program, no matter how long it was, there were roughly 15,000 attendees in 1980-81. This figure includes many duplications, since participation by one individual in numerous sessions is very common.

### Administrative Structure

Medical Care Development, Inc. is a nonprofit organization specializing in developing projects that respond to health care delivery problems in Maine. This organization serves as the fiscal and administrative agent for the Aroostook and CMITS systems. There are four full-time staff plus in-kind support staff at each hospital, usually media specialists in CMITS and educators in ACTS. Each system has a Policy Control Board composed of one representative from each organization, which shares in the governance of the project through its working committees and regular meetings. Telecommunications staff also work with Northern Maine RAISE (a Regional Approach to Improved Health Services through Education) to coordinate the use of the ACTS.

### Finances

The annual operating budget for MCDI in 1981 was approximately $200,000, which comes from user fees from the participating hospitals and a small grant. The CMITS system became operational in 1977 under a grant from the Veterans Administration; the Aroostook system was developed with a grant HEW. Major expenses include staffing, telephones, and equipment purchase maintenance.

### Resources Available

Articles about CMITS by project staff.

# MIAMI-DADE COMMUNITY COLLEGE

## Telecommunications Program

Open College (OC)

### Educational Mission

The Open College program was established in 1972 to provide credit courses to individuals who find it difficult to attend regularly scheduled on-campus courses because of family or work commitments or because they have limited mobility. The philosophy of the program assumes that Open College students are best served when they are required to make a minimal number of visits to campus and when the courses available to them have variable entry and exit time frames.

The average OC student is approximately 30 years old and female (60 percent); this profile is close to that of the on-campus population. The number of minority students taking OC courses somewhat underrepresents the minority population in the community at large. Since its founding in 1972, the proportion of students under the age of 22 has grown from about 5 to over 30 percent in 1979-80. Those in the 23 to 29 age group have declined from a high of over 40 percent in 1973-74 to 28 percent in 1979-80. Those in the 30 to 39 age group have declined slightly over the years but still constitute between 25 to 30 percent of the OC population. The proportion of students concurrently enrolled in on-campus and OC courses has increased from approximately 25 percent in 1974-75 to 55 percent in 1980-81. Thus, the OC population is composed of a growing proportion of younger students who are also taking one or more on-campus courses. However, the majority are still working adults in their twenties and thirties.

The Open College makes numerous special efforts to serve homebound and handicapped students.

### Telecommunications Technologies

The Open College uses public and commercial open broadcast television, cable television, FM radio, audiotapes, videotapes, computers, and telephones to serve its student clientele. In addition, telephone-typewriters (TTY) are used for communication between faculty and hearing-impaired or deaf students.

### Curriculum

The major part of the OC curriculum consists of lower-division liberal arts core and elective courses. In addition, some business and nursing courses also are offered. Each term, OC offers approximately 13 credit courses. Since Miami Dade Community College (MDCC) is one of the most active national producers of video and radio/audio courses, the OC curriculum includes courses produced or adapted by Miami-Dade Community College as well as courses leased from other national producers.

The process of developing new courses that employ telecommunications technologies varies, depending on the subject matter and the technology. However, it generally involves two project directors and an academic advisory committee.

The academic advisory committee is composed of faculty from each Miami-Dade campus (and any other participating institutions) who are content experts in the subject matter of the course being developed. They review and evaluate all course materials, recommend changes, suggest the inclusion of audiovisuals and current research, and review the finished program. In cases where Miami-Dade Community College takes the lead responsibility in a cooperative course production effort (as in its macroeconomics course), a national executive committee with administrative representatives from participating institutions is responsible for appointing persons to serve on the advisory committee.

The vice-president for education supervises two project directors (one for academic development, one for administrational production) who manage course development. The project director for academic development is a faculty member who, working in conjunction with an academic designer and the academic advisory committee supervises the scripting of the video segments and the writing of the student study guide and instructor guide. The administrative and production project director has responsibility for overall administration and production of course development.

### Noteworthy Features

- operates an elaborate computer-based instructional management system (RSVP), which enables faculty to offer more individualized instructional feedback to distance learners
- offers distance learners an exceptionally wide array of support services
- combines centralized management of some functions (promotion, recruiting, registration, computerized feedback, faculty instruction, etc.) with decentralized management of others (e.g., counseling, advisement, audiovisual study centers, etc.) in a multi-campus system
- uses course coordinators to assist faculty with the logistics of managing distance-learning courses
- maintains flexible entry and exit policies to facilitate independent study
- makes numerous special arrangements for homebound and handicapped students
- is working with other institutions in project CAMELOT to adapt computer-based management instruction systems like RSVP to microcomputers so that more institutions eventually can offer such services

### Problems Encountered

- encouraging a sense of ownership for Open College activities among many faculty and administrators at local campuses who perceive it as a district, rather than a campus, responsibility
- overcoming residual faculty resistance to Open College (resistance has declined substantially over the years)
- raising the current student completion rate, which ranges between 50 to 55 percent
- dealing with the differing policies, attitudes, and logistical requirements of public and commercial broadcasters and cable operators
- adapting the Open College prepackaged courses to changes in the districtwide general education curriculum

- encouraging participation by the growing minority student population, currently underrepresented in Open College courses
- striking a balance between the artistic, or aesthetic, orientation of course production staff and the content concerns of academic faculty
- adapting to the long-term trend toward higher proportions of traditional college-age students in Open College courses

### Observations About Distance Learning

- faculty-initiated phone calls early in the course period have a noticeable impact on student retention rates
- the availability of a computer-based instructional management system greatly increases student and faculty satisfaction and also improves performance in a distance-learning program
- a faculty handbook is an important tool for orienting new instructors to the program
- telecommunications technology is convenient for distance learners, but it does not necessarily increase the productivity or income of the institution

### Future Plans

- use cable television to provide undergraduate and professional continuing education to workers on a 24-hour-a-day basis
- experiment with interactive programming over cable television
- explore the use of videodiscs and microcomputers for delivering courses
- engage in more collaborative course development projects with other institutions
- implement and disseminate the software generated by project CAMELOT's efforts to adapt programs like RSVP to microcomputers
- offer an introductory Spanish language course

The Open College's commitment to provide highly individualized instruction to nontraditional students learning at a distance from the campus led to the development of the computer-based instructional management (CBIM) system known as RSVP, or Response System with Variable Prescriptions. The RSVP system, which is now available to all Miami-Dade students, enables the faculty member to manage instructional designs that are planned to give students individual attention. It does this by maintaining student records that include class assignments completed and responses to items in surveys and examinations.

RSVP prints out reports (often in the form of letters that are mailed) to the individual students; these reports include survey and examination scores, diagnosis of student problems revealed by the scores, prescribed personalized assignments, and reminders about missing assignments. In addition, the system provides the instructor with similar detailed information about each student and the class as a whole. Students appreciate the frequent, detailed feedback on their progress, and faculty have more time for individual and group student conferences focused on specific learning needs.

In addition to audio or video media, a study guide, and one or more textbooks, materials for all Open College courses include an RSVP booklet of multiple-choice test items designed to guide the students through the course objectives. These tests, which are referred to as surveys, are answered by the student on special computer cards and mailed to the OC office for processing by the RSVP system.

Miami-Dade Community College, in cooperation with educational institutions and organizations in the United States, Canada, and Britain, is developing a computer-based instructional management system called CAMELOT, which will perform functions similar to those of the RSVP system on microcomputers rather than in a batch processing mode. Once the CAMELOT software is completed and disseminated, it will enable many institutions to obtain the benefits of systems like RSVP without incurring many of the problems currently involved in adapting such large batch processing approaches.

## Faculty Roles

Faculty from all four MDCC campuses teach Open College courses. Most often faculty members teach four courses on their home campus and one OC course. The administration of the Open College is centralized in such a way that participating faculty are supervised by OC staff. (The role that faculty play in course development is described in the Curriculum section of this description.)

Delivery of courses is managed by the Open College director and five course coordinators, each of whom oversees three to five courses and the faculty teaching them. It is the job of the course coordinators to assist faculty with the logistics of managing a distance-learning course; they are generally skilled in instructional design, curriculum development, and the management of distance learning. Faculty also work with the RSVP system supervisor and the student services coordinator, who has responsibility for recruitment, counseling, testing, and other support services.

In addition to keeping in touch with their students by phone, during office hours and during group review sessions prior to examinations, OC faculty put considerable effort into writing letters to their students. At a minimum, each faculty member writes four types of letters that go to all of his or her students: a welcome letter explaining the course and its components, survey letters that accompany feedback from the RSVP system, a midterm, and a final examination letter. The RSVP system can be used by faculty to individualize the content of letters based on any number of variables (e.g., performance to date). Faculty also prepare audiotapes to help students review for midterms and finals. Instructors are given an RSVP and a faculty handbook to help orient them to OC procedures.

## Delivery System

For the convenience of the learner, Open College procedures and services are designed to be as flexible as possible. Students are able to register by telephone, mail, or in person; course materials including instruction, learning packets, and texts are available through the mail; faculty have morning, afternoon, and evening telephone hours each week; audiotapes and videotapes for all courses are available in the audio-visual study centers on each campus; flexible entry and exit dates for OC courses make it possible to learn by independent study; and video segments are available on cable channels as well as on a public and a commercial broadcast station.

Open College staff make special efforts to serve homebound and handicapped students. For example, if such students require assistance with admissions and registration forms, RSVP materials, at-home testing, special equipment or texts, OC staff will make the necessary arrangements. In addition, deaf or hearing-impaired students can be contacted by telephone-typewriter (TTY); the course entitled The Art of Being Human has been captioned for the deaf; texts for the same course have been reproduced in large print and Braille; the video segments have been audiotaped; and tests and term assignments can be put on audiotape for visually-impaired students.

The constant monitoring and feedback provided by the instructor, along with the RSVP system, help to pace and monitor student performance in these distance-learning courses. Many students also benefit from counseling, career planning, and advisement services, which are available from Open College counseling representatives at each campus. Counseling for Spanish-speaking students also is available.

## Enrollment

In the 1980-81 academic year, enrollment in OC courses totaled 2,556; in 1979-80 it was 2,909. The completion rate for OC courses is 53 percent, just slightly less than the on-campus rate.

## Administrative Structure

The director of Open College reports to the vice-president for education. The Open College staff includes 13 full-time employees and 30 to 40 part-time emplyees. The latter figure includes regular faculty on a release-time or overload basis and, in some cases, adjunct faculty.

## Finances

The average annual operating budget for Open College is approximately $400,000. The cost of course production for OC is approximately $80,000 per year. Course production funds are from direct allocations, partners in cooperative production projects, and external granting agencies. General funds are derived from the college budget but are indirectly related to the number of FTE students enrolled in Open College. Major annual expenses include full- and part-time salaries (55 percent), broadcast expenses and materials lease costs (30 percent), and student support (15 percent).

## Resources Available

Faculty handbook, student handbook, *RSVP: Faculty Computer Partnership, RSVP Newsletter,* RSVP brochure, and assorted articles and handouts.

*Television Courses*—Century 21 Shorthand, Drama: Play, Performance Perception, The Art of Being Human, Basic Nursing Skills, *America, *Roots, *The Ascent of Man, *The Long Search, Physical Assessment Nursing Skills, Survival Spanish—Introduction to Conversational Spanish, The Money Puzzle, The World of Macroeconomics

*Radio Courses*—*Business Law, *Death Attitudes and Life Affirmation, *An Optimal Self-Development—The Psychology of Adjustment

(*wrap-around course)

## Contact Person

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# MICHIGAN STATE UNIVERSITY, DEPARTMENT OF TELECOMMUNICATION

### Noteworthy Features

- established the technical feasibility of a two-way, interactive cable system
- integrated successfully video- and computer-assisted instructional technologies
- demonstrated the first use by learners of response terminals to interact with segments of videotaped lessons delivered via cable television
- provided evidence showing that individuals can learn more effectively using a two-way compared with a one-way cable television delivery system
- demonstrated that no special system maintenance is required for two-way communication if the system is properly designed at the outset

### Problems Encountered

- acquiring the extensive amount of unconventional knowledge required to develop instructional materials for this kind of system
- exerting the extra effort required to develop and implement an interactive instructional system rather than merely using a regular one-way cable system
- accepting the fact that, though successful, this system could not be replicated in 1978 because of the dearth of other two-way interactive cable television systems

### Observations About Distant Learning

- interactive cable is an efficient and effective means of providing instruction to large numbers of persons spread out among remote locations
- videotaped instruction is more practical than live instruction with respect to continuing firefighter education; tapes can be interrupted and repeated when needed to accommodate the work style of firefighters
- two-way, interactive cable instruction was found to be more effective than comparable one-way television in teaching cognitive information

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## Telecommunication Program

Rockford Two-Way Cable Project

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### Educational Mission

The Rockford Two-Way Cable project was one of three projects funded by the National Science Foundation to test the application of two-way cable telecommunication to the delivery of urban social services and urban administration. It involved the development and delivery of an instructional program designed to enhance the prefire planning capabilities of Rockford firefighters. A major purpose of the project was to implement and evaluate a two-way, interactive training system via cable that provided standardized instruction to remote locations in a cost-efficient manner. Over 200 firefighters, involving most fire stations in Rockford, Illinois, were involved in this experimental project. The project was not continued in Rockford after NSF funding terminated in 1978. However, several two-way cable systems proposed in franchise applications have been modeled after this system.

### Telecommunications Technologies

The project utilized a two-way, interactive cable television communication system that used a minicomputer to control interaction with a prepackaged, videotaped series of prefire planning lessons. Learners were required to respond periodically to short quizzes using special response terminals. The response terminal input fed directly to a central minicomputer that, in turn, summarized quiz responses and displayed them over the cable channel as part of the ongoing lesson. Individual learners could monitor their own learning progress.

### Curriculum

The 12 part, noncredit, studio-produced, videotaped course segments in prefire planning were developed by faculty members in the Department of Telecommunication at Michigan State University. This was the only course that was part of this particular NSF project. Members of the Rockford Fire Department worked closely with the faculty members to develop the course. Each lesson was about one hour in length and generously sprinkled with quiz questions to maintain viewer interest, test for knowledge gain, and provide learning reinforcement. The lessons could be interrupted at any time (to accommodate fire calls) and then resumed at a later time. The instructional program was wholly self-contained and needed no supplementary materials. The series of lessons included both a pretest to determine entry-level knowledge and a posttest.

### Faculty Roles

Two Michigan State University faculty members, specialists in telecommunications, designed the prefire planning curriculum. Task analyses were performed on the prefire plan survey process actually followed by Rockford Fire Department officers, and a series of sequential learning components was identified along with behavioral objectives. The lessons were extensively pretested and refined before final viewing by the firefighters. Training officers required little special training to operate and monitor this form of instruction.

### Delivery System

The project utilized an experimental research design to compare the relative effectiveness of four different instructional delivery methods of the prefire planning course: a two-way individual response method (where each learner used his own response terminal to interact with videotape), a two-way group response method (where one response terminal served a group of from four to eight learners at particular fire station sites), a one-way paper and pencil response method (where answer sheets rather than interactive terminals were used to record quiz answers), and a one-way covert response method (where lessons were viewed but only mental responses were required). Each "methods" group included between 50 to 54 firefighters located in the various Rockford fire stations. Most lessons were viewed during the morning hours and then repeated, if needed, later in the day.

### Enrollment

Over 200 Rockford firefighters were involved in this experimental project. The project began in 1975 and ended in 1978. All of those beginning the course completed it as part of an on-the-job, in-service training program of the Fire Department.

## Administrative Structure

Lesson materials were developed and the comparative study of instructional methods directed by two full-time specialists from the Michigan State University Department of Telecommunications; both were graduates of the MSU master's program in telecommunications. Four MSU faculty members worked part-time on the project handling equipment development and other technically related activities such as instructional design, experimental design, and evaluation. Both the Rockford Fire Department and the locally owned cable company in Rockford cooperated extensively with MSU in implementing this experimental instructional program.

## Finances

The project was supported by a $430,000 National Science Foundation grant. Major expenditures were for salaries and equipment, including the purchase of response terminals for use in interacting with the videotaped lessons and the production of the lessons themselves in a Michigan State University television studio. Use of the local cable system was donated as was the time spent by Rockford Fire Department personnel. An elaborate analysis of total instructional costs per student per lesson was made comparing the several cable delivery methods with traditional methods previously used by the Fire Department (e.g., lectures at the Training Academy and lectures at each fire station). Overall, costs for use of the two-way, interactive cable method compared favorably in most instances with those for traditional methods. If costs had not included production of the videotaped materials, costs for instruction via interactive cable would have been substantially lower than costs for traditional delivery methods. Continuation of the project beyond the grant depended on a substantial investment in system upgrading by the locally owned cable company in Rockford. The company elected to invest its capital funds elsewhere, however, and the project was discontinued in 1978.

## Resources Available

Baldwin, Thomas F., et al., *Volume I: Summary of Final Report, Michigan State University Rockford Two-Way Cable Project*, Department of Telecommunication, Michigan State University, East Lansing, Michigan, June 1978; and Baldwin, Thomas F., et al., *Volume II: Final Report Michigan State University Rockford Two-Way Cable Project*, Department of Telecommunication, Michigan State University, East Lansing, Michigan, June 1978.

- two-way, interactive television, where individuals have personal response capability and receive personal feedback, was more favorably assessed than one-way television and considered equal to live instruction by participants in this project
- fire service pesonnel have a real need for and interest in ongoing instructional programs

### Future Plans

Those involved with this project believe it will still be several years before the state of the art in U.S. cable television will accommodate the Rockford instructional delivery model. The model seems to have been technically ahead of its time.

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# MILWAUKEE AREA TECHNICAL COLLEGE (MATC)

### Noteworthy Features

- uses telecommunications technologies to deliver vocational/technical as well as liberal arts courses
- integrates experiential learning opportunities (take-home kits, on-campus laboratory sessions, speeches, and group discussions) into courses using telecommunications
- emphasizes hands-on training through development of learning packages that integrate print, video, and take-home kits
- has developed cooperative arrangements with various businesses to develop learning packages that serve both academic and industrial training needs
- has increased its reliance on print media in an effort to enhance the program's capacity to individualize instruction
- offers students an independent study option with a continuous registration system
- helped establish a statewide Technical School of the Air

### Problems Encountered

- funding of course production in the face of budget cuts
- finding other community colleges or vocational/technical institutions interested enough in delivering technical education via television to share course development costs

### Observations About Distance Learning

- heavy reliance upon open broadcast television works best with highly motivated learners who do not need much structure
- less highly motivated learners seem to benefit from more structured learning packages that rely less on the television and more on the print component
- television can be used successfully as a component in GED-preparation classes
- hands-on learning experiences can be successfully integrated into courses using television

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## Telecommunications Program

College of the Air (TV College)

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## Educational Mission

Milwaukee Area Technical College's (MATC) TV College offers lower-division liberal arts and vocational/technical courses to both on- and off-campus students in the metropolitan Milwaukee area. Approximately 65 percent are male, and the average age is 30. The program serves a broad cross section of ethnic groups. Special arrangements are available for high school students, incarcerated students, and homebound and handicapped students.

## Telecommunications Technologies

TV College uses two public broadcasting stations owned by the community college district and a public radio station in addition to audiotapes and videotapes. TV College staff and faculty use telephones extensively in their interactions with students. Through linkage with cable companies in the region, TV College coverage has been extended to students in central Wisconsin, Michigan, and Illinois.

## Curriculum

TV College generally offers 12 liberal arts and vocational/technical courses per year (6 each semester). Since the program's inception in 1971, most of the courses have been of an introductory liberal arts nature. Increasingly, TV College is expanding its offering of vocational/technical courses, which provide opportunities for hands-on training in subjects such as electricity, photography, and computers (through take-home kits and on-campus lab sessions). TV College staff have been working cooperatively with corporations such as Texas Instruments and the Heathkit Division of Zenith to develop television courses that also serve the training needs of workers. In addition to leasing nationally distributed television and radio courses, TV College has produced 12 courses since 1971. All courses are "retired" after a five-year period.

MATC's TV College staff have been centrally involved in expanding the use of television to the entire state of Wisconsin. A newly formed statewide Technical College of the Air eventually will offer a complete technical curriculum via television. In the first two years of operation of the new statewide TV High School, over 500 of the adults who took a televised GED preparation course passed their high school equivalency tests and thereby qualified to pursue college courses. MATC participates in both these statewide programs. (Descriptions of these programs are included in the Wisconsin Vocational Technical and Adult Education System description in this book.)

## Faculty Roles

With the exception of a few adjuncts, all TV College instructors are regular MATC faculty. Course production usually entails the involvement of one or more content experts assisted by a production crew, which is hired on a project basis. More recently, MATC faculty have worked with representatives of selected industries, who share in the production and underwriting of particular courses. Faculty also develop the accompanying print material for locally produced courses.

## Delivery System

Television and radio courses are broadcast twice a week and repeated at least twice that same week to accommodate students' varied schedules. In addition, video and audio cassettes are available at all four MATC campus libraries as well as at some public libraries. Students can meet with their instructor one week before each of the three course examinations at optional pre-exam conferences. Make-up exams can be taken at the Achievement Testing Center. Written class assignments and test results are mailed to students along with faculty comments.

TV College offers an independent study option with a continuous registration system for students who prefer to watch or listen to tapes in the library and to complete class assignments and tests at their own pace. Courses by newspaper and via the University of Wisconsin's Educational Telephone Network (ETN) are also available to MATC students. Handicapped students can listen in the library to special audiotapes made from broadcast television instructional segments. Incarcerated students participating in TV College need only have their exams proctored by a staff member of their correctional institution. With special permission from their counselors, high school students can also take TV College courses.

## Enrollment

Since its inception in 1971, over 15,000 persons have registered for TV College courses. In 1981-82, the program had 1,150 enrollments (as of the third week of the semester) and its completion rate averaged 72 percent.

## Administrative Structure

TV College is a separate office within the four-campus Milwaukee Area Technical College system. The three full-time staff are supplemented by six to seven faculty per semester and a production crew of four to five who operate on a project basis.

## Finances

The annual budget of TV College is approximately $225,000. Major expenses include staff and faculty salaries, course production, and course acquisition.

## Resources Available

Course schedules, TV High School materials, telecourse review package.
Courses: Communication Skills I & II, Design I, Introduction to Photography, Marketing Perspectives, History and Philosophy of Law Enforcement, Administration of Justice, Electricity—AC and DC Circuits, Psychology of Human Relations.

## Future Plans

- forge additional linkages with business for purposes of course development
- experiment with a focused cluster approach to television course offerings in which all courses offered in a semester would relate to a specific academic field such as business or health
- experiment with a version of computerized feedback for learners
- expand use of cable television
- explore the applicability of videodisc technology for technical education

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# NATIONAL UNIVERSITY CONSORTIUM FOR TELECOMMUNICATIONS IN TEACHING (NUC)

## Telecommunications Program

Institutions participating in the National University Consortium include:

Boston University
California State University, Domenguez Hills
Empire State College
Iona College (New York)
Linfield College (Oregon)
Pennsylvania State University
Rhode Island College
Seattle Pacific University
Southern Vermont College
Temple University
University of Maryland
University of Pittsburgh
University of San Francisco
University of South Alabama
Witchita State University

## Educational Mission

The National University Consortium is a national organization of colleges, universities, and public television stations involved in offering adult learners a structured but highly convenient course of study leading to the bachelor's degree. It was created in 1980 as a way of enabling numerous colleges and universities to make maximum use of instructional materials and teaching techniques developed by the British Open University (BOU) and by the University of Maryland's Open University in cooperation with the Maryland Center for Public Broadcasting. These resources were developed to serve busy adult learners who prefer to learn at home on a part-time basis. (A separate, detailed description of the University of Maryland Open University program is included in this book.)

NUC students are generally in their late twenties to early thirties, 55 to 60 percent are women, most have taken some college courses before and currently are employed on a full- or part-time basis, and most have family incomes in excess of $20,000. The majority are part-time students who have considerable self-discipline and are highly motivated to learn.

## Telecommunications Technologies

The television components of NUC courses are transmitted via the WESTAR II satellite to cooperating public broadcast stations around the country for videotaping and later replay. In some communities PBS programming also is carried on cable television channels. Telephones are used extensively for interaction between students and tutors.

## Curriculum

The NUC curriculum is divided into three main interdisciplinary concentrations: behavioral and social sciences, humanities, and technology and management. The NUC's directed study approach to instruction can be characterized as:

> ". . . a learning system based on structured reading, optional opportunities for tutor-student interaction and supplementary television programs . . . The directed study methodology relies on television for only *part of* the instruction. The television programs are designed to supplement the material presented in carefully designed course guides and in textbooks and selected readings. Television programs pace and motivate the student through the eighteen-week semester, but print is the primary medium of instruction." (NUC Project Brief II, April 1980, pp. 3-4.)

(For a more detailed description of the print components of NUC courses, see the Curriculum section of the description of the University of Maryland's Open University in this book.)

Just as the Maryland Open University had to make certain adaptations in the British Open University curriculum, extending this curriculum to the diverse NUC institutions has necessitated additional adaptation. The staff and faculty of the Maryland Open University modified full-year British courses into nine- and occasionally six-hour courses in the American course format. Most NUC members have used this larger course block format; however, Pennsylvania State University, for example, has divided nine-credit-hour NUC courses into smaller three-credit courses. Member schools are always free, and are encouraged, to allocate their own credit for NUC courses.

As it has turned out, the larger six- and nine-hour blocks of credit are viewed favorably by most adult learners because they are better able to devote their attention to the inevitable logistics (deadlines, interactions with tutors, etc.) of a single course than two or three courses. Some NUC institutions also have made adjustments in the 18-week semester format adopted by the Maryland Open University in order to fit the NUC courses into their administrative structures.

The consortium both adapts BOU courses and originates its own. NUC adapts BOU courses by developing alternative print materials and/or by using video segments produced by the BOU or the American course producers. Such adaptations reflect the consortium's efforts to adjust to the diverse curricular needs and preferences to member institutions. When it is necessary, NUC and its member institutions also will develop an entirely new course with original print and video segments. There are eight NUC courses currently in use; six available on satellite and two in a nonbroadcast (videotape) mode each semester.

Along with their efforts to offer adults a convenient and high-quality curriculum leading to a bachelor's degree, NUC staff also are encouraging member institutions to make special efforts to accept students' transfer credits and to assess their prior learning for academic credit. With or without such supportive institutional policies, NUC's goal is to enable an adult to obtain a bachelor's degree in 6½ years by taking only NUC courses.

At most member institutions, the NUC curriculum has been integrated into the college of liberal arts or the office of continuing education.

## Faculty Roles

The British Open University model uses, and the NUC model recommends using, tutors to help adult learners integrate the print and video material. This activity normally occurs during optional weekly classes held at convenient discussion centers (e.g., campus classrooms, public buildings) as well as by telephone and mail. The original conception of the tutor's role was that of a content expert who, although not a regular university faculty member, answered questions and encouraged discussion but did not introduce new content beyond that provided in the print and video components of the course. Among NUC members there is some variation in this pattern. In some cases regular faculty serve as the content experts and in others the optional classes are omitted in favor of more student/tutor interaction by telephone and mail.

## Delivery System

Students taking a nine-credit-hour NUC course normally spend an average of 20 hours per week engaged in course activities. This includes viewing one half-hour video segment alternate weeks on the local public broadcast television channel or on videotapes; reading extensively from the unit text (study guide), numerous set texts (required readings), and the syllabus; attending an optional two-to-three-hour, tutor-led class and preparing one or more written assignments. At most NUC institutions the discussion classes with the tutors are optional, but at the University of San Francisco they are required. At all NUC institutions extensive telephone and mail contact between student and tutors is encouraged.

## Enrollment

The enrollment at the 12 institutions participating in NUC in the 1980-81 academic year was 863. In the fall of 1981 the enrollment at the same institutions was 655. Data on the percentage of students concurrently enrolled in NUC and on-campus courses at participating institutions are not currently available.

## Administrative Structure

The National University Consortium is a nonprofit corporation governed by a board of directors elected by the voting members of the consortium. In addition to the board of directors, NUC has an advisory council that assists the staff with curricular development and delivery system design decisions. Institutions and television stations that are members of NUC enjoy the following benefits: voting rights in the election of new members to the board of advisors; participation in the annual membership meetings and faculty assemblies; access to NUC courses and accompanying materials; the

### Noteworthy Features

- combines public and private colleges and universities in a national consortium that offers the same undergraduate curriculum (with local variations) to part-time adult learners
- offers American adults a degree-oriented interdisciplinary curriculum adapted from the British Open University that has a special appeal to highly motivated, self-disciplined learners
- distributes six television courses per semester via satellite to participating public broadcasting stations and colleges and universities
- combines both print and video instructional materials, but relies on print to convey approximately 85 percent of the course content
- offers courses in large credit blocks
- offers a curriculum intended to lead an adult student to a bachelor's degree in 6½ years of part-time study
- uses tutors to help students integrate print and video components of the courses and to evaluate students' written assignments and examinations

### Problems Encountered

- accepting the reality that the rigorous, upper-division nature of most NUC courses makes them more appealing to the highly motivated, self-disciplined learners than to a broader cross section of adult learners
- evolving a consortial structure that allows all members to participate in decisions about curricular, delivery system, and administrative matters
- adapting British Open University courses to the academic structure of American colleges and universities
- obtaining and distributing books to numerous institutions that use a predominantly print-based curriculum

### Observations About Distance Learning

- part-time adult learners seem to

prefer large credit-block courses organized around an interdisciplinary theme
- inter-institutional coordination takes up an inordinate amount of staff time
- American colleges and universities will not readily offer a common undergraduate curriculum unless they can adapt it to their local needs and influence its future evolution
- it is easier to win faculty and administration acceptance of a new curriculum if its is both very rigorous and heavily print-based than if it is not
- to be a successful NUC member an institution needs: (1) an existing degree structure into which the NUC curriculum can fit, (2) existing support services for adult learners, (3) the enthusiastic support of at least one high-level official, and (4) a capacity for conducting an effective promotional effort

## Future Plans

- expand the number of NUC members
- expand the size of the board of directors
- explore the possibility of using audio cassettes as part of the NUC delivery system
- publish the results of a recent student evaluation survey
- explore the possibilities of decentralized course development by NUC institutions, who would then share their products with each other
- achieve financial self-sufficiency

## Contact Person

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right to make adaptations in NUC courses at the local level and the opportunity to participate in new course development. A "contact and development" status is available to institutions or stations that are just getting underway with the NUC curriculum. The NUC staff has ten full-time and two FTE part-time employees.

## Finances

Information about the annual operating budget of NUC is not available. To date the consortium has received three grants from the Carnegie Corporation of New York. The first, in 1979, was for a six-month feasibility study; the others were three-year-long grants in 1980, 1981, and 1982 to support operation and expansion of the consortium. Original NUC plans call for a $10,000-a-year membership fee for full members and a $3,000 yearly fee for institutions that need an initial developmental year.

## Resources Available

*Participating Colleges Procedures, Tutor Guide, Student Guide, Station Procedures Manual, Change Magazine* article on NUC, occasional papers.
Course: Exploring Language

# NEW YORK UNIVERSITY

## Telecommunications Program

Sunrise Semester

### Educational Mission

Since 1957 New York University has been offering undergraduate liberal arts courses over the commercial television station WCBS-TV. Sunrise Semester was originally broadcast only in the New York city area, but since 1963 it has been available to all stations on the CBS network. Students and viewers include traditional-aged college students with scheduling or commuting problems, professionals seeking intellectual enrichment, and elderly and homebound persons looking for a convenient learning opportunity. Sixty-five percent of the students are women; their average age is 38; their estimated average income is $18,000 to $20,000; and the majority have completed three years of college.

[As of Fall 1982, due to a change in the CBS morning programming schedule, Sunrise Semester is no longer being carried over the CBS network. Various alternative modes of distributing Sunrise Semester courses (e.g., cable television) are being explored.]

### Telecommunications Technologies

Sunrise Semester uses open broadcast television and is available over the entire CBS commercial network. Telephones are used for contact between faculty and local New York City students.

### Curriculum

Each year Sunrise Semester offers four introductory-level liberal arts courses to its students. The topics are intended to be timely and to appeal to a broad cross section of learners. The courses often reflect an interdisciplinary approach to the topic. For example, in the spring of 1981 semester the courses were "Women and Men in a Changing Society" and "Radio, Television, and the New Technology." Most recently there has been an effort to combine the best aspects of traditional discipline-based courses with those of high-quality broadcast journalism (e.g., "The McNeil-Lehrer Report"). Each half-hour class session is designed to stand by itself and to fit into the overall course. Viewers have the option of taking the courses for college credit or on an informal audit basis.

### Faculty Roles

The faculty members selected to develop the courses and host the television segments are generally either regular or adjunct faculty at New York University who are hired on a contract basis to develop and deliver the course. Most courses are designed especially for Sunrise Semester and the Sunrise Semester staff prepares a "Viewer's Guide," which includes an introduction to the course, course requirements, required and suggested readings, a list of individual program titles, and a schedule of broadcast dates in the New York metropolitan area and on the CBS Network. Textbooks are available through the NYU Book Center.

### Delivery Systems

Classes are broadcast three half-hours a week for the entire semester at 6:00 or 6:30 a.m. Faculty send open-ended feedback forms, which students can use to ask questions. Responses to any student question or assigned term papers are returned to students within a one- to two-week period. Local students have their instructors' telephone number and can call during faculty office hours. Students taking courses for credit must complete and mail in a midterm and a final exam as well as a term paper. Auditing students can take a pass-fail exam and receive a certificate of completion. Most students who take courses for credit do so through NYU or through local colleges and universities. Neither videotape copies or transcripts of Sunrise Semester classes are available to learners because of provisions in the contract with CBS.

### Enrollment

Sunrise Semester is carried over 65 CBS stations and reaches a viewing audience in excess of one-half million people. Approximately 300 students audit each course, and less than 50 take it for credit. Since Sunrise Semester offers four courses per year, audit enrollments number approximately 1,200

### Noteworthy Features

- distributes college courses nationally over a commercial network (22 half hours of network programming for each course)
- has existed for 25 years as of the 1981-82 academic year
- enjoys a long-standing commitment by CBS and NYU to provide educational programming
- designs programs to appeal to the intellectual interests of a broad audience interested in knowledge that helps them understand current issues and problems

### Problems Encountered

- obtaining sufficient funds to maintain and improve the program
- overcoming resistance from faculty and administration
- dealing with the bureaucratic structures of two large organizations (NYU & CBS)

### Observations About Distance Learning

- it is important for colleges and universities to adapt to the expanded availability of new telecommunication technologies

### Future Plans

- work more closely with other divisions of the university
- explore the possibility of using two-way cable
- explore the possibility of using teletext to supplement print material for students
- use telephone conference calls to increase interaction between faculty and students
- explore the possibility of making transcript and videotape copies of broadcast program available to students
- offer a B.A. in Liberal Studies
- distribute Sunrise Semester program to cable television systems after their initial run on the CBS network

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and credit enrollment approximates 200. The completion rate among auditors is approximately 10 percent, although almost all who take the courses for credit complete them successfully. Courses carry four credits and cost $250 to take for credit; $20 is charged for materials to audit the course.

## Administrative Structure

The Sunrise Semester program is located in the Office of Educational Technology in the College of Arts and Sciences. There are two full-time employees on the Sunrise Semester staff.

## Finances

The overall budget for Sunrise Semester is approximately $600,000 per year. Program costs are shared, with CBS contributing about $500,000 for production costs and NYU providing about $100,000 for staff salaries, print materials, and some nonpersonnel production costs. The major expenses of the program are for production, salaries, and print materials. Broadcast time is contributed by CBS and its affiliate stations.

## Resources Available

Study guides for courses and promotional brochures.

# NORTH CAROLINA STATE UNIVERSITY SCHOOL OF TEXTILES (NCSU/ST)

## Telecommunications Program

Textile Off-Campus Televised Education (TOTE)

## Educational Mission

The Textile Off-Campus Televised Education program, which began in 1976, offers undergraduate and graduate courses in textile-related subjects to working adults all over the United States and in at least one foreign country. Almost all (95 percent) of the TOTE students are management-level employees or management trainees in textile-related industries who are seeking to upgrade their skills. In spite of this, the profile of TOTE students is very similar to that of the NCSU School of Textiles on-campus students, who are mostly (75 pecent) male, with an average age of 30 years. Approximately 80 percent have previously taken college-level courses, and less than 5 percent are concurrently enrolled in on-campus classes.

## Telecommunications Technologies

TOTE uses color video cassettes of regular on-campus classes to serve its off-campus students. The studio/classroom in which the faculty presentations are taped contains low-cost video equipment designed so that a single student-operator can record the class. Two cameras with manual zoom lenses are operated by the student-operator from the back of the room, and a third remote-control overhead camera is mounted above the instructor. This third camera focuses on the surface of a special desk that can be used to record written notes, illustrations, photographs, textile samples, and 8 mm film loops projected from below.

Rather than retaining tapes of classes beyond their initial viewing by students, TOTE staff erase virtually all video cassettes for later reuse. In addition to being less expensive than storing tapes for reuse, the procedure ensures that course offerings remain current and faculty presentations are relaxed and informal. All off-campus students must have access to video cassette playback equipment in order to take TOTE courses.

## Curriculum

The TOTE curriculum includes lower- and upper-division undergraduate as well as graduate courses in textile-related subjects.

Regular on-campus courses are videotaped live and unrehearsed and then sent out to TOTE students in this unedited form. TOTE students are provided with a course handbook describing course procedures, the course outline, and suggested and required readings. In addition, they receive the same printed handouts given to on-campus students.

Approximately 40 to 50 percent of TOTE students take courses for credit: the remainder audit the courses. TOTE staff have a flexible policy that allows students to switch their status in any given course from credit to audit or vice versa within the first 45 days of the semester. Thus, working adults can make adjustments between their initial expectations for the course and their actual experience once enrolled. Although students cannot earn a NCSU degree by taking only TOTE courses, these credits can be applied toward a regular degree program.

## Faculty Roles

The success of the TOTE program depends on the voluntary cooperation of those School of Textiles faculty willing to teach their regular on-campus courses in the studio/classroom environment and also willing to support TOTE students learning off campus. For TOTE students, most interaction with faculty occurs by way of telephone or written, mailed communication. Faculty use the mail in various ways to convey written homework assignments and print materials. At least one face-to-face meeting with a faculty member is required for all TOTE students taking courses for credit in a degree program. This can occur on campus, at the worksite, or in a mutually convenient location. A faculty handbook and an optional studio/classroom orientation are available to help faculty get accustomed to the TOTE program. Faculty who teach a TOTE course receive a stipend to compensate for the extra responsibilities.

## Delivery System

Even though 95 percent of TOTE students

### Noteworthy Features

- delivers undergraduate and graduate credit courses to workers in textile-related industries
- videotapes live on-campus classes in a studio/classroom for later viewing by distance learners
- employs a low-cost video cassette distribution system capable of serving individual learners located in any state
- enjoys cooperative working relationships with industries that normally pay student tuition and supply educational resource materials
- elicits the cooperation of staff at other colleges and universities in providing support services to TOTE learners
- maintains a flexible policy allowing adult learners to move between credit and audit status in the first 45 days of a course
- erases and then reuses videotapes rather than storing them for later use
- encourages the availability of library resources for student use at distance learning sites

### Problems Encountered

- overcoming initial faculty resistance
- designing the studio/classroom to provide faculty with a sense of control over the equipment
- serving small numbers of students at widely dispersed sites across the country
- working within the limitations inherent in videotaped versions of live unrehearsed classroom presentations (e.g., "talking head," "talk and chalk")
- compensating for the lack of adequate laboratory facilities at some off-campus locations

### Observations About Distance Learning

- the flexibility of a videotape delivery system can be a mixed blessing for students if they get too far behind and have to make-up many video segments
- most questions students would ask the instructor in a face-to-

face classroom setting *do* get answered in this distance learning mode
- working adult students have a very high success rate in the TOTE program
- the motivation of working adult students is enhanced by interaction with people like the learning site coordinators in the TOTE program

### Future Plans

- develop short courses
- develop long-term lease arrangements for short courses
- develop a certificate program
- work toward offering a complete degree program through TOTE

### Contact Person

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are working in textile-related industries, anyone with access to video cassette playback equipment can enroll in a course. Students who are not at industry sites are usually able to make use of the library and video equipment resources of colleges, universities, or public libraries in their local areas. TOTE courses are offered at an average of 30 different sites each semester. TOTE video cassettes are mailed or shipped (by UPS) to participating industries or directly to students' homes. Each industry assigns a coordinator who has responsibility for receiving videotapes and returning them to TOTE within two weeks, distributing books and other print materials, proctoring exams, and providing general support to the students. Those students not at industry sites are responsible for finding an appropriate person to proctor exams for them.

Since faculty teaching TOTE courses assign numerous required and suggested readings in addition to textbook readings, the cooperating industries each maintain reference libraries for use by their TOTE students.

### Enrollment

The TOTE program has served students in 18 states and one foreign country. In 1979-80 there were 162 students, and in 1980-81 there were 150 students enrolled in TOTE courses. Enrollment figures are recorded as of the first week of the semester. Although it is preferable that TOTE classes have a total enrollment of 10 or more students, the program is flexible enough to offer classes for as few as 4 or 5 or as many as 30. However, there need not be more than one registrant to each location. The course completion rate for both credit and audit students is approximately 75 percent.

### Administrative Structure

The TOTE program is located within the Instructional Technology Services office of the School of Textiles and is coordinated with the university's Department of Extension and Continuing Education. Three members of the Instructional Technology Services staff plus six student operators work part-time in the TOTE program.

### Finances

The annual budget for the TOTE program is approximately $15,000 to $20,000 per year. This does not include the time of faculty or full-time staff who spend part of their time with the program. It does, however, include wages for the student operators. The program has been able to support itself on tuition income virtually from its beginnings in 1976. Student tuition includes the costs of print materials and video cassette shipping. Return shipping, required travel, and textbooks are paid for by the registrant, usually the employer. Start-up costs for the program were relatively low because the initial technical facilities were adapted from existing equipment used by a previous university television operation. Current value of the equipment is approximately $45,000. Major expenses include staffing and tape duplication and distribution.

### Resources Available

Faculty Handbook, TOTE program brochure, occasional papers.

# NORTHERN VIRGINIA COMMUNITY COLLEGE (NVCC)

## Telecommunications Program

Extended Learning Institute (ELI)

### Educational Mission

ELI offers liberal arts and occupational and technical courses for college credit on an independent-study basis. The program primarily serves full-time employed adults averaging 35 to 45 years of age. All the institute's students study on an independent basis in their homes, but approximately half of them are concurrently enrolled in other courses at one of the five NVCC campuses. Both the majority and minority student populations in the institute are roughly reflective of the community as a whole. ELI also serves incarcerated students.

### Telecommunications Technologies

ELI uses public and commercial broadcast television and commercial FM and AM radio as well as video and audio cassettes to serve its students. Telephones are also used extensively in student-faculty interaction.

### Curriculum

Thirty liberal arts and technical and vocational courses are available through ELI. An independent-study format allows students the convenience of registering for courses (with the exception of broadcast courses) on any working day of the calendar year. All courses are self-paced; a generous maximum time limit allows the student to progress through course work at a comfortable rate. At specified "checkdates" during the course, students are contacted by ELI staff to see if they are actively pursuing their work and to offer assistance and encouragement.

Approximately one-third of ELI's courses use television or radio. The rest are entirely print-based. All television and radio courses include nationally or locally produced textbooks and student study guides. Some are supplemented by books of additional readings.

ELI staff and faculty have produced four television courses and one radio course, and these are available to other institutions. Other television and radio programs offered by ELI are acquired from national distributors. Telecommunications courses include subjects such as art history, music appreciation, the history of photography, small business management, consumer auto repair, child development, and Shakespeare.

### Faculty Roles

Approximately 80 percent of the instructors for ELI courses are full-time faculty from various NVCC campuses. They are involved in course development (on a release-time basis) as content experts on project teams, which also include writer/editors, production staff, and an ELI instructional designer as team leader. Faculty support is available to students taking the courses during regularly scheduled telephone and office hours. Faculty also travel to local correctional institutions to meet with incarcerated students. Faculty are assisted with administration tasks such as student record-keeping and objective grading by course clerks.

### Delivery System

Most learning takes place in the students' homes. However, prearranged conferences and optional seminars usually occur on the college campus. Videotapes and audiotapes for broadcast as well as nonbroadcast courses are available to students at five NVCC campuses and at the central branch of the Arlington Public Library. Proctored exams are offered on-campus. ELI students have access to the same services and facilities as other NVCC students.

### Enrollment

Over 27,000 students have enrolled in ELI since its creation in January 1975. The average enrollment is 7,000 students each academic year. Approximately one-third of these ELI enrollments are in television, radio, audiotape, and videotape courses. Enrollment figures are recorded at a point 15 percent of the way through the course period. The completion rate for ELI courses is just over 60 percent.

### Administrative Structure

ELI is a division of NVCC that employs faculty, administrators, five instructional-design faculty, and 14 classified support staff. Teaching faculty are employed by their re-

### Noteworthy Features

- integrates the use of telecommunications into a large independent study program
- uses a continuous registration system that allows students to begin courses (except broadcast television) at their convenience
- employs self-pacing with flexible time limits
- offers students a variety of broadcast and nonbroadcast television and radio formats to choose from
- modularizes a small-business management course into either 15 one-half-hour video programs or 36 four-to-five minute modules

### Problems Encountered

- reporting grades within a traditional student records system while employing continuous registration and a flexible time-limit policy on courses
- working within financial aid restrictions that apply to veterans and students taking correspondence study
- working within current limits on ELI's ability to extend its capacity to offer feedback to students (after an unsuccessful attempt to implement a version of Miami-Dade Community College's RSVP computer feedback system on a main-frame computer, ELI is exploring the possibility of developing a similar system using microcomputers)
- overcoming resistance among some faculty members in spite of many strong faculty supporters

### Observations About Distance Learning

- individualized feedback is a crucial variable in student success
- providing students with positive feedback via faculty-initiated contacts early in a course is very effective
- many students use independent study courses as a way to ease their reentry into classroom courses

### Future Plans

- experiment with the use of audio and video teleconferencing as part of a potential statewide system
- use dial-access audiotapes via touch-tone telephone in order to offer students branching options
- develop a practical computerized student feedback system to assist faculty
- expand course offerings

### Contact Person

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spective departments. ELI courses are considered part of their regular teaching load.

### Finances

ELI is supported primarily from institutional funds, with an annual budget of $380,000. Another $60,000 to $70,000 for production and broadcast time is accounted for by other programs. Revenues from ELI courses distributed outside Virginia go into the state general fund. The institute has received some grants and contracts from HEW, CETA, and commercial publishers. Major expenditures include ELI staff salaries, public broadcasting time for television, course production and acquisition, and telephone and postal expenses.

### Resources Available

Television Courses: History of American Art, Auto Mechanics for the Layman, History of American Photography, and Topics in Small Business Management.
Radio course: Topic Music.
Print-based independent study courses: Students' Guide to Accounting, Course Guide to Economics, Your Guide to Writing With a Purpose, Career and Life Planning for Adults—a six-volume series.

# PENNSYLVANIA STATE UNIVERSITY, DIVISION OF LEARNING AND TELECOMMUNICATIONS SERVICES

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**Telecommunications Program**
Open Learning Program (OLP)

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## Educational Mission

Penn State is a multi-campus university serving thousands of students both in this country and abroad. In response to the needs of students for whom the campus classroom is not always, or ever, the most convenient place to learn, Penn State has over the years evolved a number of flexible options. Many of the programs that make such opportunities possible are administered by the Division of Learning and Telecommunications Services, which is responsible for all media-based activities at Penn State.

One such program is the Open Learning Program. It is a programmatic concept administered by the Division's Independent Study by Correspondence Program and combines print and telecommunications media to extend the educational resources of the university to individual learners. By using various combinations of print, audio, and video, the Open Learning Program makes it possible for students to take both credit and noncredit courses at the undergraduate, graduate, and continuing education levels.

Students taking noncredit open-learning courses include union members pursuing advancement in their field (e.g., journeymen's license) and adults seeking personal enrichment. Of those taking courses for credit, approximately 50 percent are traditional college-age students enrolled at one of the 20 Penn State campuses; the other half are adults in their late twenties to early forties who are accumulating credit courses (e.g., members of the military stationed abroad). Graduate and professional continuing education programming at Penn State serves doctors, teachers, and government employees. Taken as a whole, open learning students tend to be working adults in their twenties and thirties and approximately 60 percent are women. The Open Learning Program makes special efforts to serve handicapped students and residents of rural areas.

## Telecommunications Technologies

In addition to the mail system, which is the primary delivery mode of the Open Learning Program, public broadcast, satellite and cable television, along with audiotapes, videotapes, audio teleconferencing, video teleconferencing, computers, and telephones are used to serve learners. The University's closed-circuit television system primarily serves students in residence, but there is considerable use of the same video courseware both on and off campus.

Off-campus learners are served by the university's public broadcast television station (WPSX), which serves a 22-county region in central Pennsylvania, and by satellite earth stations that are used to receive prerecorded educational materials from the National University Consortium, PBSs Adult Learning Programming Service, and the Appalachian Community Services Network. In addition, a separate media system is used to provide instruction to persons who work in and through hospital settings.

The cable television system used by the Open Learning System is called PENNARAMA. It represents a partnership between Penn State and individual cable systems in Pennsylvania that have organized into a nonprofit organization called Pennsylvania Educational Communities System (PECS) for the purpose of developing a statewide educational delivery system. Under an agreement signed in September 1979, PECS undertook the responsibility of building and maintaining a microwave relay system interconnecting individual cable companies throughout the state. Penn State has responsibility for coordinating the PENNARAMA program service with other institutions and state agencies that also make use of the system. The eastern loop of the system, which in November 1981 linked eight cable companies serving some 140,000 households in 70 communities, is complete; the western loop is already underway. By 1983, any cable company in the state will be able to link up to the system. It is expected that by 1983 PENNARAMA will reach 1.5 million households.

## Noteworthy Features

- serves distance learners through a program that integrates all nonclassroom media in a separate instructional system
- enhances its use of video programming by building on academic and administrative procedures already in place and accepted for correspondence study
- operates within an organizational structure that has responsibility for all on-campus and off-campus media-based activities
- utilizes resources of all 20 Penn State campuses to support the needs of distance learners
- uses regular campus-based faculty to assist in the design, production, adaptation, and delivery of distance-learning courses
- uses diverse technologies (open broadcast television, cable, satellite, videotape, audiotape and mail service) to serve distance learners
- manages educational programming for a cable television network (PENNARAMA) that eventually will have the capacity to link most cable companies in the state into a single educational network
- coordinates programming of an educational cable network (PENNARAMA) that is being constructed at the expense of local cable companies
- is cooperating with three other universities and a private videotape distribution firm to reach learners who own videotape players.

## Problems Encountered

- enduring the long waiting period before prevailing attitudes and organizational structures change in response to needed innovations
- devising organizational structures capable of meeting the needs of on- and off-campus learners within a large university setting

- moving from the difficult and time-consuming process of introducing new ideas and concepts (e.g., using a new technology) to institutionalizing the academic and administrative policies and procedures associated with maintaining the new practices
- devising a long-term financial base for PENNARAMA

### Observations About Distance Learning

- it is important to keep faculty involved in and supportive of open learning
- extensive and well-organized student support services are essential to the success of an open-learning program
- adult learners are much more vocal and demanding consumers than traditional college-age students
- it is easier to obtain academic and administrative acceptance of video programming for distance learners in an institution with an existing correspondence program
- telecommunications technologies should be used only when they in some way improve the quality of student/faculty interaction

### Future Plans

- experiment with a preview week during which faculty describe upcoming courses on special televised programs
- provide general counseling services by video
- provide programming to new communities as PENNARAMA expands
- expand use of learning centers and libraries for distribution and use of materials

### Contact Persons

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## Curriculum

Through the Open Learning Program learners can pursue credit toward an associate degree in Letters, Arts, and Sciences, toward a B.A. or B.S. degree, or toward a graduate degree. There are also credit and noncredit courses that can be taken for personal enrichment as well as professional and occupational continuing education programming. Audio and video teleconferencing are used for some of the professional continuing education courses.

Most of the courses with prerecorded video components are at the undergraduate level and are produced at Penn State or are adapted from instructional components of courses from the National University Consortium, PBS's Adult Learning Programming Service, the Appalachian Community Service Network, or other national distributors. Of the existing 200 open-learning courses, about 25 include video components. At any given time, the video components of about ten courses are on PENNARAMA and three courses on WPSX.

Recently Penn State joined with three other universities in an agreement with Twentieth-Century Video to provide video components of courses produced by the universities to individuals with video cassette recorders in their homes. Although TCV will distribute the videotapes to them, the individual universities will retain all other contacts with the students—including registration, instruction, counseling, and other academic and administrative services.

Whether adapting instructional materials from others (80 percent of the courses with video components fall into this category) or using materials totally produced at Penn State (20 percent), the OLP distance-learning efforts that involve video are influenced by its long-standing independent study by correspondence tradition. Most courses are print-oriented, with the video segments constituting from 5 to 40 percent of the curricular content. Some courses have as many as ten video half-hours for each hour of academic credit, and others have as few as two and a half hours. Students are encouraged to go beyond the study guides and texts into readings that offer many alternative points of view. Considerable emphasis is placed on developing critical thinking skills as well as mastering specific course content. Open-learning courses with video components produced by Penn State tend to be upper-division interdisciplinary courses (e.g., Through the Genetic Maze, The Behavioral Revolution).

## Faculty Roles

The instructors who teach Open Learning Program courses are all regular departmental faculty who are hired by OLP on an overload basis. Penn State faculty are centrally involved in selecting and adapting instructional materials from national distributors and in producing courses for use in the closed-circuit system and OLP. Faculty often communicate with their students by mail, and much of the students' performance is evaluated through five or more written essays, plus midterm and final exams—which often include essay questions. Telephone contact between faculty and students both on a scheduled and on an informal basis, is also common. However, the primary interaction is by written correspondence.

## Delivery System

The largest delivery component of the Open Learning Program is the mail system. Over the years independent study by correspondence has come to include the exchange of audiotapes, slide/tape sets, laboratory kits, and telephone calls between faculty and their students. Just as various technologies gradually have become integrated into correspondence study, the manner in which video components are used in open-learning courses owes much to the tradition of correspondence study at Penn State.

Because there were already existing academic policies and administrative procedures to facilitate serving learners at a distance from the campus, the video courses have been more readily integrated into the university than otherwise might have been the case. Procedures for course selection and approval, participation of regular faculty in distance learning, and evaluation of student performance were already in place.

The support services available to students also reflects this pattern. Students can register for courses by phone, mail, or in person.

Student advisers on the staff work closely with students, assisting them in choosing courses and developing curricular plans. Faculty correspond with students by mail regarding required essays and examinations. Students taking courses have access to a toll-free telephone number that enables them to interact with faculty and staff. An orientation pamphlet explaining the process of open learning in general and the course requirements in particular is provided to students at the beginning of each set of new courses. In addition, a computer-based institutional management system is used to score tests and give students individually prescribed feedback and assignments.

Video components of courses are distributed over PENNARAMA and the public broadcasting stations WPSX and are now being placed in learning centers and libraries. On PENNARAMA, a four-hour module of lessons is repeated six times a day on a 24-hour-a-day basis each week, thus enabling students to view at their convenience. The four hours of television lessons on WPSX are repeated about two times per week, although there is no set pattern.

## Enrollment

In 1980-81, enrollment in open-learning courses numbered over 12,000, with about 250 in courses with video components. As additional courses with video components are added and as distribution technologies—incuding PENNARAMA—are exploited, the figure is expected to increase. The completion rate for all open-learning courses is approximately 63 percent.

## Administrative Structure

The Open Learning Program is a programmatic concept under the direct supervision of the Independent Study by Correspondence Program. The latter program reports to the Division of Learning and Telecommunications Services, which handles all media-based activities at Penn State. Other major administrative units of the division are the Department of Telecommunications, Audio Visual Services, University Photographic Services, and University Graphics Services. All provide media services to classroom instruction and the Open Learning Program. Staffing for open learning includes 40 full-time employees. The Division of Learning and Telecommunications Services has a staff of about 200.

## Finances

The portion of different organizational budgets that account for the Open Learning Program amount to approximately $1.5 million per year. Major expenses include staff and faculty salaries, leasing materials, and course production. The OLP program is supported by fees, contracts, grants, and general university funds.

## Resources Available

PENNARAMA Newsletter, PSU/PECS agreement for the development of PENNARAMA, brochures and catalogs on open-learning courses, occasional papers.

Television Courses
Fat Chance!
Finite Earth
Introductory Principles of Nutrition

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# PUBLIC BROADCASTING SERVICE (PBS) EDUCATIONAL TELECOMMUNICATIONS PROGRAM SERVICE

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**Telecommunications Program**
Adult Learning Programming Service

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## Educational Mission

The Public Broadcasting Service (PBS), a national membership organization of public television stations, established an Adult Learning Programming Department in July 1980 that began offering programming in fall 1981. For more than two decades many local PBS member stations have provided some level of support for adult learning programs sponsored by colleges and universities in their area. However, establishing the Adult Learning Programming Department was the first national PBS initiative devoted exclusively to the support of adult learning.

The Adult Learning Programming Service encourages cooperative relationships between PBS member stations and colleges and universities in their respective communities for the purpose of offering television courses to adults who want to study at home or at their workplace. The service does this by selecting television courses (with considerable input from educators and broadcasters); negotiating financial and copyright arrangements with the course producers; licensing (for a fee) colleges and universities to use the courses; and providing some promotional, administrative, and technical assistance services to the local stations and colleges.

Currently the Adult Learning Programming Service offers college credit and professional development courses. In the future it will also offer informal adult learning courses and programs as well as career training courses and programs.

Most of the learners currently taking the college credit courses are working adults in their mid twenties to mid thirties. Approximately 60 percent are women; they are employed full- or part-time. These characteristics generally vary from community to community and reflect the socioeconomic makeup of the particular locality. Although the figures change somewhat from one semester to another, approximately 220 of the 292 PBS stations (over 80%) and over 500 colleges and universities in 47 states participated in the Adult Learning Programming Service in its first year (1981-82).

## Telecommunications Technology

The majority of the students taking PBS adult learning courses view the programs over their local public broadcast television channel. In many communities public broadcasters and educators offer repeat broadcasts of the courses over local cable access channels available to the PBS station or to the college (no pay cable channels may be used). In some areas broadcasts also may be provided over commercial television outlets. Students on campus and in various off-campus learning centers use video cassettes to view programs they may have missed or want to review. PBS distributes television courses nationally by transmitting its Adult Learning Schedule via the WESTAR IV satellite to its member stations. The station can use the programming at the time it is fed, or can videotape it for later broadcast.

## Curriculum

Currently the Adult Learning Programming Service offers a wide variety of courses in areas such as liberal arts, business, the health sciences, and teacher training. The majority are introductory level undergraduate courses, but some courses can be used at the graduate level or for professional development (e.g., the course Teaching Students with Special Needs).

The television courses integrate video segments (varying from 13 to 30 half-hour segments) with a textbook, student study guide, administrator's manual, a bank of test items, and, occasionally, books of readings. All telecourses selected for broadcast over PBS stations must have open-circuit broadcast quality technical and production standards. Examples of such telecourses are Understanding Human Behavior, The Art of Being Human, Contemporary Health Issues, and Focus on Society.

The Adult Learning Programming Service currently offers seven to ten telecourses each regular academic term plus a shorter summer schedule. In order to ensure that its schedule will meet the needs of as many colleges and universities as possible, PBS Adult Learning conducts national teleconferences to screen television courses that might be offered in the future. Excerpts from adult learning courses are transmitted on a closed-circuit basis to all participating PBS member stations to be viewed (or videotaped for later viewing) and evaluated by local public broadcasters and groups of educators. The fall 1981 screening included 35 programs. In addition to an information packet describing the courses, participants in the screening are given program preference sheets on which they can indicate their priorities for upcoming course schedules.

Once PBS announces the schedule of courses for a term, educators and broadcasters can request preview packets for individual courses. These packets usually include an overview of the course, a faculty and administrator's guide, lesson summaries, course objectives, and sample study guide lessons. For those educators who want to review the entire text, book of readings, or study guide, publishers of these print materials normally will provide examination copies. College faculty and administrators review two programs from each series in the schedule.

## Faculty Role

In addition to participating in the course selection process, faculty at participating colleges and universities play a central role in designing and implementing the academic student support services that accompany the video segments. Faculty can develop print materials that supplement or replace those provided by the television course producer. In addition, faculty wishing to play a more active role in shaping the academic experience for their telecourse students can produce their own audio and videotapes and make them available to their students through local cable television channels, radio stations, libraries, or learning centers. Although faculty are free to develop such supplementary materials and are not required to assign their students all the video or print components, they cannot edit or alter the original telecourse video segments without the permission of the producer. Faculty also can provide additional opportunities for student faculty interaction (e.g., field trips, audio teleconferences, radio call-in programs) in addition to the telephone, mail, and face-to-face meetings normally available to telecourse students.

## Delivery System

The delivery system of the Adult Learning Programming Service involves various organizations and levels of activity. Among the organizations are the television course producers, PBS itself, PBS member stations, colleges and universities, consortia, and, in some cases, cable companies and commercial television stations. Activities are concentrated at the national and local levels and in some cases state or regional levels. The responsibility of the major actors in this process are described in the following paragraphs.

*A. The Adult Learning Programming Service* first acquires exclusive rights to distribute and license telecourses from the producers of the courses (e.g., Coastline Community College). This means that for the period of the agreement with the producer (most agreements are for three years), public broadcasting stations have the right to broadcast the telecourses for instructional uses to colleges and other entities. However, if a local station is not going to broadcast a PBS telecourse during a particular academic term, local colleges can license the series directly from the producer and distribute it through means other than public television.

PBS also retains the right to air the telecourses over cable-access channels available to local colleges or stations in conjunction with the local PTV broadcasts. Colleges that wish to use local commercial stations to provide repeat broadcasts of PBS telecourses can make arrangements with the local PTV station and telecourse producer(s).
and telecourse licensing rights (in some cases audio/visual rights also) for the telecourses and licensing educational institutions, the Adult Learning Programming Services staff performs the following services:

- selects telecourses (with input from the PBS Adult Learning Service Advisory Council and participants in national screenings)
- holds national screenings of excerpts from

### Noteworthy Features

- provides a national schedule and distribution system for colleges and universities interested in offering television courses to adult learners
- involves more than 80 percent of the public broadcast stations and more than 500 colleges and universities in the same nationally coordinated educational delivery system
- provides local broadcasters and educators with extensive promotional and logistical support
- provides a framework that encourages cooperation between public broadcasters and educators as well as among educators from different institutions
- represents a major commitment by a broadcast television entity to provide educational programming for adult learners
- provides systematic coordination and adequate lead time for planning, such conditions previously did not characterize relationships between most public broadcasting stations and colleges
- is open to all colleges that can develop cooperative arrangement with a local PTV station
- lowers the fee significantly for most institutions over previous delivery systems
- coordinates a large national delivery system with a small staff

### Problems Encountered

- conveying what television courses are to potential students who are unfamiliar with the concept
- devising strategies to encourage effective partnerships between local broadcasters and educators
- communicating to faculty members the important role they can play in determining the quality of a television course
- assisting colleges to develop delivery systems for distance learners that incorporate a level of planning and support equivalent to other academic programs offered by the institutions
- accepting the fact that some

state funding patterns do not reimburse colleges' for any off-campus courses
- identifying enough excellent television courses to satisfy needs of two and four year colleges
- convincing colleges that courses are credit worthy
- helping colleges that are unfamiliar with promotion and marketing to effectively plan and implement outreach efforts capable of attracting off-campus learners
- helping some colleges and universities understand ways in which student support services for adult learners need to be similar to or different from those they provide traditional-aged on-campus students
- mounting a new national service with a small staff, limited funds, and short lead time
- streamlining administrative procedures to make it easier for colleges and stations to participate in the service
- devising a fee structure for television course licenses that would be fair to individual institutions, multi-campus systems, new consortia, and older consortia that have had special long-term working relationships with course producers.

## Observations About Distance Learning

- a national delivery system such as the Adult Learning Programming Service must have flexible policies and a responsive approach if it is to succeed in working with the diverse institutions found in American postsecondary education
- the extent and quality of student support services provided by colleges are crucial to the institution's success in enrolling and retaining students
- station-college partnerships are working effectively in almost all communities; both groups seem willing to make this new venture work
- students' reactions to this new service generally are very positive

various television courses to obtain input from local educators and broadcasters
- conducts national teleconferences to announce schedules and assists institutions and stations with promotion as well as implementation of programming and student support services
- holds national previews of two or more video segments from each telcourse selected for the the schedule
- provides promotional support for information campaigns at the national and local levels
- assists broadcasters and educators on site at national and regional conferences, and in communities (within the limits of staff time and resources)
- responds to telephone and mail inquiries

B. The responsibilities of the *local PBS member stations include:*
- marketing telecourses to local colleges, universities, and consortia
- transmitting licensing agreements to colleges and returning them to PBS
- working with colleges to schedule times for local broadcasts of telecourses
- working with colleges to promote telecourses to the community
- hosting teleconferences
- assisting with surveys
- arranging for broadcast time

*C. Colleges and Universities* that license a PBS telecourse acquire the rights to: (1) offer the telecourse for credit or noncredit, (2) receive the print materials that accompany the course and (3) tape the programs off the air for replay at times and in places convenient to students for the term of the license.

College responsibilities include:
- working with their local public broadcasting station to develop a broadcast schedule
- choosing courses the institution wants to offer
- signing PBS license agreements and paying the license fees and student enrollment fees
- publicizing the courses in the community
- assigning appropriate faculty and support staff and developing an effective delivery system
- submitting enrollment figures to PBS within 30 days of the beginning of the broadcast semester.

The greatest variation in the delivery system occurs at the local institution levels. In its publications and teleconferences the staff of the Adult Learning Programming Service encourages institutions to provide appropriate academic and support services. At this early stage in the evolution of the service it is difficult to assess the extent to which colleges and universities are supporting their distance learners. (For a discussion of some student support services see the Faculty Roles section of this description.)

## Enrollment

In the first broadcast semester in which the Adult Learning Service offered courses, fall 1981, the enrollment was approximately 20,000. During that same semester over 80 percent of the PBS member stations and approximately 500 two-year and four-year institutions participated in the program. Data on student completion rates are not yet available.

## Administrative Structure

The Adult Learning Programming Department is part of the Educational Telecommunications Program Service at the Public Broadcasting Service. The staff of the Adult Learning Programming Service includes five full-time employees and the senior vice president in charge of the entire PBS educational program service. The Adult Learning Advisory Council, which is composed of eight distinguished broadcasters and educators, advises the PBS staff.

## Finances

The overall fiscal year 1983 operating budget of the Adult Learning Programming Service is approximately $508,000 for administration and distribution and $638,000 for program costs. Major expenses include the costs of obtaining exclusive broadcasting and licensing rights to television courses, salaries, promotion, printing, and distribution.

Income comes from licensing fees and student enrollment fees paid by colleges and universities. For fall 1981, license fees for PBS television courses varied between

$300-$400 per course. The fee entitles a single institution to offer a course for one academic term. Special incentives are built into the fee structure for the multiple college groups (e.g., a consortium) in the same PBS station signal area. Participation in a group of 6-10 institutions reduces the per institution fee to $275 or $350, and in a group of over 20 institutions, each pays only $150 to $200. Institutions offering four or more courses also receive a slight reduction. Fees are also adjusted for multi-campus systems in the same state and college consortia organized before January 1981 that had pre-existing arrangements with producers of courses included in the Adult Learning Schedule.

Student fees are $15 per enrolled student. A flat student fee arrangement is also available. The income from these fees is divided between the telecourse producer and the Adult Learning Programming Service.

## Resources Available

Fact sheet for the current Adult Learning Schedule, telecourse information packet, teleconference support information

tive; many adults say the television courses represent their only opportunity to return to school
- if faculty members have access to video segments and print materials far enough in advance, they are much more willing to participate in television courses

## Future Plans

- hold more national video teleconferences for broadcasters and educators
- publish a national newsletter
- encourage more interaction among participants in national video teleconferences
- coordinate activities with the Annenberg Project
- streamline administrative procedures even further
- conduct research, in cooperation with appropriate agencies, on pedagogical issues growing out of PBS's experiences with adult learners
- develop print materials for informal learners in order to expand the audiences for telecourses
- create college credit and informal learning materials to augment PBS prime time programming

## Contact Persons

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# QUEENSBOROUGH COMMUNITY COLLEGE OF THE CITY UNIVERSITY OF NEW YORK

### Noteworthy Features

- is the first and largest program in the country serving homebound students with an interactive telephone-based delivery system
- makes available an extensive array of support services to homebound students
- provides homebound students a flexible vehicle for making the psychological and physical transition from learning in their homes to learning on the campus, if they are able
- offers homebound students cultural enrichment activities that seek to mainstream them into organizations on campus
- offers homebound students assistance in obtaining work placement for summers or on a regular full- or part-time basis
- stimulates four-year and graduate universities to respond to the needs of the homebound by producing graduates capable of upper-level work
- uses an interactive approach to distance learning that enables faculty, homebound students, and classroom students to communicate at the same time
- was designated a national model by the U.S. Office of Education and awarded a dissemination grant from FIPSE

### Problems Encountered

- obtaining sufficient financial support to maintain the program
- solving scheduling problems for homebound students caused by the limited number of classrooms equipped with conference telephone systems
- delivering services to homes over a large geographical area
- overcoming resistance from faculty members
- compensating for the absence of a live visual component to accompany the telephone interaction

### Observations About Distance Learning

- some homebound students are able to gradually make the transition to on-campus classes

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## Telecommunications Program

External Education Program for the Homebound

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## Educational Mission

To meet the educational needs of individuals who, because of physical disabilities, are unable to leave their homes to attend classes on a college campus. Students include individuals with orthopedic and neurological disabilities, accident victims, persons attached to life-support equipment, and those not able to physically sustain being out of the home for long periods. The program has also been used (in cooperation with psychologists) to serve a few school phobics. Students range in age from 18 to 75, with the average age being approximately 27. The sex and ethnic composition of students in the program mirrors that of the on-campus population.

## Telecommunications Technologies

The Homebound program uses a two-way conference telephone system, which makes it possible for homebound students to participate in regular on-campus classes. The student at home uses a regular telephone receiver or a rented or purchased speaker phone.

Approximately 50 classrooms at Queensborough are wired and equipped with telephone conference units; many are capable of serving up to 16 homebound students. In addition to having telephone contact with faculty and on-campus students, some homebound students use portable computer terminals linked to the CUNY computer for data processing courses. Others, in a secretarial class, use a portable word processor tied directly into the college's secretarial science laboratory.

## Curriculum

Queensborough's External Education Program for the Homebound makes it possible for homebound students to take a wide variety of courses leading to associate degrees in liberal arts and sciences or applied sciences. Students can also concentrate in career programs such as accounting, data processing, or secretarial sciences. Students in the Homebound program are admitted on the same basis as all Queensborough students and are subject to all regulations and course requirements. Some exceptions are made in physical education. Since homebound students participate in regularly scheduled on-campus classes (conducted in classrooms equipped with two-way conference phones), there is no need to develop a special curriculum for these distance learners. However, faculty do need to be given a special orientation to enable them to most effectively integrate the homebound students into the ongoing class sessions.

## Faculty Roles

Faculty who volunteer to have their courses included in the Homebound program only have to commit themselves to turning on the two-way conference telephone system and interacting with the homebound students. However, in addition, many faculty participate in orientation sessions and an ongoing series of meetings to discuss the program and the students with other faculty and the Homebound program staff. On rare occasions individual faculty members go to the homes of their homebound students to give them personal instruction and advice.

## Delivery System

An essential element of the Homebound program at Queensborough is the extensive network of support services available to the students. These services begin when a potential student contacts the program. The intake process includes personal and academic counseling, first by phone and then during a home visit by the counselor. Once a physician's statement and proof of high school graduation or its equivalent are obtained, the counselor administers placement tests in the student's home. Following extensive academic and personal counseling regarding particular needs, new students participate in a conference-call orientation session in which they communicate with each other and with their counselor.

Once participating in classes, homebound students may have available the services of volunteer tutors from the community, from local corporations, or from the regular student body of the college. Often one or more students in the on-campus course will take notes for the homebound student and either deliver them in person or have the Homebound program staff deliver or mail them. Exams are either proctored in the student's home by his or her counselor or handled on the honor system at the discretion of the faculty member. Faculty and staff have developed some experiments, cassettes, and lab manuals to assist students taking particular courses.

Peer support among homebound students is encouraged by the program staff by means of a newsletter each semester with news about, and contributions from, homebound students; by telephone conference calls for orientation and skill development; by informal links between homebound students who previously took the course with those taking it now; and through organized social events like the annual reception, where homebound students who are able to participate are transported to the college. In addition, special efforts are made to mainstream homebound students via telephone into the cultural activities of the college by involving them in the activities of various clubs and organizations.

## Enrollment

In 1979-80 there were 68 students participating in the program. Since the program began in 1973 with 9 students, 23 have graduated from Queensborough and 5 of these have received B.A. degrees from other colleges. The program experiences little attrition once students are actively involved. Many homebound students take reduced academic loads because of physical limitations.

## Administrative Structure

The External Education Program for the Homebound is a separate program within the Division of Continuing Education at Queensborough Community College. The program has five full-time and two part-time employees, plus extensive support personnel.

## Finances

The overall budget for the Homebound program is approximately $160,000. Since its initiation in 1973, the program has received grants from the U.S. Office of Education, the Fund for the Improvement of Postsecondary Education (FIPSE), New York State Department of Education, and the City University of New York. Beyond the initial equipment costs, the program's major expenses are for staff salaries and telephone line charges. On the average, it costs $400 more per year to educate a homebound student than a regular on-campus student. However, this cost must be weighed against the virtual certainty that students served by the program would not otherwise receive any education.

## Resources Available

Fourteen-minute videotape description of the program, brochures, consultants, and a guidebook intended for use by administrators contemplating the development of such a program.

- homebound students do not have to be in the classroom to be motivated to learn
- even though educational institutions must be willing to provide extra services to homebound students to make such a program successful, this does not have to be a costly proposition; upperclassmen, work-study students, graduate students, and volunteers can provide many services
- it is possible to provide quality educational experiences for homebound students
- the administrative details of such a program can be worked out
- the telephone is particularly well-suited to this educational mission because it permits greatest flexibility, is relatively inexpensive, can be used for small as well as large programs, and can be used for delivery of support as well as academic content services
- having a dependable vehicle for transportation is essential

## Future Plans

- offer a GED program for homebound students that is linked to the on-campus program
- test-run the self-contained audio cassette course developed by faculty in English composition
- expand cooperative relationships with four-year and graduate universities within CUNY
- use a recently received FIPSE grant to expand the program beyond the A.A. degree, so that homebound persons will be able to enroll in a B.A. program
- expand cooperative relationships with industries to increase job placement options for homebound students who can do productive work in their homes
- encourage more colleges to undertake homebound programs

## Contact Person

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# RAND CORPORATION AND TELECABLE OF SPARTANBURG

**Noteworthy Features**

- has used, and continues in a limited way to use, interactive cable televison for instruction
- integrates live instruction with student use of data response terminals and telephones to interact with instructors
- demonstrates that students, teachers, and older adults can adapt relatively quickly to an interactive instructional medium
- continues to use interactive cable television after the end of the initial NSF-funded experiment.

**Problems Encountered**

- continuing interactive programming beyond the period of the NSF grant
- training teachers with no previous television experience to adjust to television and to the interactive format
- recruiting students into the adult basic education program

**Observations About Distance Learning**

- funding for research on learning via telecommunications offers no assurance that learners will continue to be served after the experiment terminates
- for some GED students, home cable classes provide the only means of finishing high school
- although many potential barriers to enrollment were examined, none adequately explained the relatively low participation in the GED program, even though it was comparable to the rate for conventional GED classes at the local college
- the cable medium is effective in producing knowledge gains
- in the noncredit parent education class, learner outcomes were equivalent for those using only the telephone to interact with the instructor and for those using both the telephone and a data response terminal
- in the GED program, learning was as effective for those participating in the interactive cable program in their homes as for

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## Telecommunications Program

Spartanburg Interactive Cable Experiments

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### Educational Mission

One of three cable television projects funded by the National Science Foundation (1975-78), the Spartanburg Project sought to gauge the marketability and learning effectiveness of using interactive cable telecommunications to deliver select educational programs to adults in their homes. A GED-preparation and a parent education program were among those selected for the experiment. Participants were predominately female, white, and 30 to 40 years of age; those in the parent education program had completed more formal education than those in the adult basic education program. (Though not reviewed here, the NSF grant also supported development and delivery of a day-care staff training program.) Neither the GED nor the parent education program is still in operation. A senior citizens' program is the only educational program that currently uses the two-way capacity of the cable system. It was not part of the original NSF project.

### Telecommunications Technologies

The project transmitted live two-way programming over a local cable television network using two major interactive audio devices—the telephone and simple data terminals located in the students' homes. The data terminal was the only mode of student faculty interaction in the GED-preparation class, but both the data terminal and the telephone were used in the parent education classes.

### Curriculum

The GED program, a group-paced instructional program in mathematics, reading, and language skills, was developed by faculty at Spartanburg Technical College. It included 180 hours of instruction over the course of 15 weeks, three hours a day, four days a week. A notebook of supplementary materials was developed by the teachers for use with special-topic review, in testing, and as a visual aid.

The parent education program, which was derived from the broad body of literature based on the work of Piaget, consisted of 36 hours of programming three days a week for 12 weeks. Supplementary print materials also were used in this course. The program used a variety of instructional methods, including lecture/discussion, quizzes, films, demonstrations, programmed materials, and interactive problem-solving.

The current senior citizens' program focuses on educational, consumer, and entertainment topics.

### Faculty Roles

Only faculty with no previous television experience were selected for the GED program. Each of the three faculty involved received extensive training prior to program broadcast: their 65 hours before the camera included conducting a series of short trial lesson segments. The faculty became comfortable with the television cablecasting process in about three months. In general, instructional methods similar to those developed for use in the conventional classroom were used in the televised program. The project manager both developed and taught the parent education course.

For the GED program, a special classroom observation instrument was designed to assess the impact of the electronic environment on the teaching process. Comparisons were made of the teaching process in conventional classrooms and on cable television. Records were kept of both the nature of the classroom activities and the frequency of classroom interactions in cable and conventional classes taught by each of the three GED teachers. Use of this instrument showed that the instructional process changed substantially when teachers used interactive cable for the first time (i.e., they used longer individual work periods and less interactive drill in the cable class than in the conventional class). In subsequent cable classes, the magnitude of these differences declined as faculty learned how to make more effective use of the interactive cable technology.

### Delivery System

Both instructional programs were delivered to private homes via cable television in the

Spartanburg area. To assess the effectiveness of the cable television instructional delivery method, the research design provided for the following:

(1) a comparison of conventional classroom-run GED programs (held at Spartanburg Technical College) with the cable GED programs, and (2) a comparison of two types of student/instructor interaction devices that were used in the parent education cable class (student-to-instructor communication by telephone during or after the class period and student use of data response terminals in addition to the telephone).

The cable GED class also made use of the data response terminal, located in each participant's home. The data terminal could be used by students to respond to quizzes and instructor-posed questions, and the instructor could monitor the learning progress of individual students on a video display computer terminal located nearby in the broadcast studio. The student terminal contained both alpha and numeric response capabilities, the former used to send short messages to the instructor such as "understand," "don't understand," "slow down," and "give example."

The current senior citizens' program delivers live two-way programming to the major senior center facility in the area. Programs run for one half-hour twice a week. One program each month is planned and conducted by the seniors themselves.

### Enrollment

A total of 82 students were involved in the GED cable classes over the life of the project, an average of 10.5 persons per class. There was no significant difference in the course retention rate for cable students compared with conventional classroom students (for both it was about 86 percent). Recruitment to the cable GED program, however, proved difficult; an extensive assessment of the marketing and outreach strategies used suggested that an effective job was done. Project staff posited that attitudes toward the need for education among those without a high school diploma may explain the low turnout, the same low turnout experienced by conventional adult basic education classes in the Spartanburg area and elsewhere in the United States. Demand for the parent education program, though, was high, requiring little advertising. Thirty-seven parents and "caregivers" were involved in the first class, and 32 parents were involved in the second. Each current senior citizens' program serves between 30 and 45 older adults.

### Administrative Structure

NSF awarded the grant to a consortium of the Rand Corporation, TeleCable Corporation, and Spartanburg Technical College. Key project staff worked closely with those at the state office of child development, the local department of social services, and the adult basic education staff at Spartanburg Technical College.

In October 1977 a new local corporation, Communications Services, Inc., was founded by the project site manager, and this corporation began operation in June 1978 as a vehicle for continuing the educational use of cable once the NSF project ended. The senior citizens' program was developed by Communications Services, Inc. and was initially funded by the South Carolina Committee for the Humanities. It is now supported totally by the local cable company, TeleCable.

### Finances

The project was supported by a $1.1 million NSF grant over 34 months. Students were offered free connection to the cable system and free cable service for the months they were enrolled in the experimental courses. Other expenditures were for staff salaries (instruction and research); the purchase and installation of the converters and home terminals necessary for reception and transmission of signals between students and teacher; and advertising to increase awareness about the programs, especially among disadvantaged populations. Each GED cable student was charged $34.35 for tuition, fees, and books, the same amount charged to students at the local college.

### Resources Available

Lucas, William A., et. al., *The Spartanburg Interactive Cable Experiments in Home Education.* Santa Monica, Calif. Rand Corporation, Report R-2271-NSF, February 1979.

those enrolled in conventional on-campus classes; the absence of the social environment of the classroom did not seem to affect learning

- unlike the GED program, the parent education class was able to attract enrollments for the cable class with very little advertising
- participation by faculty in the experimental cable GED course allowed them to improve their use of both the cable system and the conventional classroom
- senior citizens prefer half-hour rather than one-hour classes

### Future Plans

- continue operation of the local corporation (Communications Services, Inc.) to support the educational use of interactive cable and the development of special topic programs for airing via one-way cable
- continue operation of an interactive video/two-way audio cable program for senior citizens in Spartanburg

### Contact Persons

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# RIO SALADO COMMUNITY COLLEGE OF THE MARICOPA COUNTY COMMUNITY COLLEGE DISTRICT (MCCCD)

**Noteworthy Features**

- is an identifiable program within a noncampus community college that is responsible for alternative delivery of education throughout an entire seven-campus district
- is experimenting with low-cost delivery systems using radio, audio cassettes, video cassettes, cable television, audio teleconferencing and slow scan television
- offers alternative delivery courses to inmates in correctional facilities
- uses a microcomputer to grade exams, to give prescribed student feedback, and to manage student records
- enjoys strong support for alternative delivery systems from the college administration at the district level
- places heavy emphasis on student support services

**Problems Encountered**

- overcoming resistance to alternative delivery courses from faculty at sister colleges in a multi-college district
- obtaining enough audio courses from other producers to expand course offerings
- finding audio courses that are of sufficiently high quality to be acceptable to public radio broadcasters
- obtaining funds to develop new audio courses
- determining how to best serve distance learners in a community with seven community college campuses that may have more than seven different cable companies

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## Telecommunications Program

Instructional Technology and Design (ITD)

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### Educational Mission

Maricopa County Community College District serves over 9,226 square miles of central Arizona. Rio Salado Community College, as the noncampus college of this seven-college district, offers classroom courses throughout the county and has sole responsibility for the development and delivery of instruction through alternative delivery systems. The Instructional Technology and Design (ITD) program at Rio Salado offers lower-divison liberal arts and occupational courses. The majority of ITD students are employed full-time in the home (22.6 percent) or on the job (44 percent). Of these students, 73 percent are female, 53 percent are between the ages of 21 and 35, 26.7 percent are between the ages of 36 and 50, 36.1 percent have 0 to 30 hours of college credit, and 29 percent already have 31 to 60 credit hours. Fifty-four percent are not enrolled concurrently in other Rio Salado courses. Reliable data on student ethnic composition are not available. The ITD program also serves learners at various corrections facilities in the area. In addition, the college operates an NPR station, KMCR-FM, and, on its subcarrier, offers Sun Sounds, a radio reading service for the blind and print handicapped.

### Telecommunications Technologies

Rio Salado Community College uses public and commercial television, cable television, its own public broadcasting radio station, audio teleconferencing, slow scan television, video cassettes and audio cassettes, correspondence courses, and the telephone to serve its students.

### Curriculum

The majority of ITD courses are introductory core and elective liberal arts courses. In addition, the program offers some courses in vocational subjects and in areas of particular interest to community residents (e.g., small business, nutrition). The liberal arts and special-interest courses are offered for credit, and the vocational courses (e.g., electronics, safety) are offered on a noncredit basis as part of a program called Occupational Update. Each semester Rio Salado offers ten courses, which normally include seven television, one radio, one audio cassette, and one correspondence course. Up to the present, ITD has produced only one radio course on its own, leasing the rest of the television and radio courses from other institutions. Whenever a course is produced at Rio Salado, a design-team approach is used that involves the dean, a faculty member content specialist, an instructional designer, and an operations person. A local advisory committee is likely to be used to provide input on course content.

### Faculty Roles

The instructors for ITD courses are normally part-time faculty hired on contract for their special disciplinary expertise. The faculty member who serves as the content specialist in the design and development of a course may or may not be the on-the-air host. A faculty person also may be put on contract to develop course materials such as student study guides, faculty guides, or test bank items. When serving as the teacher of the course, a faculty member has primary responsibility for determining course requirements, grading papers and exams, issuing grades, and communicating with students. Faculty have considerable latitude in selecting the type of support services that will accompany their courses.

### Delivery System

Students may view the video portions of ITD telecourses over cable, public broadcast, or commercial television. Radio courses are available over the college's public radio station KMCR-FM, and audio cassette courses and video cassettes of some telecourses are available at local libraries and at the learning centers of the MCCCD campuses.

Courses may include a student orientation meeting, but the number of additional review classes, field trips, or extra assignments vary according to the preferences of the faculty member. Exams either may be sent through the mail or taken on the campus. Faculty are encouraged to write three or more newsletters for students each semester and to provide opportunities for face-to-face and telephone contact. ITD staffs a student hotline, which enables students to call and leave messages for instructors during times other than published office hours.

Recently, ITD staff have begun using a microcomputer to assist in grading exams, to provide students with prescriptive feedback, and to maintain student records. Student response to the computerized feedback has been very positive.

ITD staff and faculty also serve students at a women's prison and at a juvenile detention center. Inmates view video cassettes and have telephone access to faculty. In some cases, faculty meet with students at the prison facilities.

Sun Sounds, a reading program for the blind and physically handicapped, is broadcast on the subcarrier of KCMR-FM to listeners equipped with special SCA receivers.

ITD staff have recently begun using audio teleconferencing in combination with slow scan television (one-way) to deliver instruction.

## Enrollment

Enrollment in ITD has averaged 1,000 per semester (2,000 per year) for the past three years. Enrollment figures are officially recorded on the 45th calendar day of the semester. The completion rate for these courses is approximately 75 percent by the 45th day of the semester and 55 percent by the end of the semester. At least half of those who do not complete are dropped by the faculty during the semester because they are not participating actively.

## Administrative Structure

Selection and operation of ITD courses is coordinated by the director of instructional technology and design, who reports to the dean of alternative education. The manager of KMCR-FM and the director of Sun Sounds also report directly to this dean. Rio Salado Community College is the noncampus college among the seven colleges of the Maricopa County Community College District. The ITD program has five full-time and two part-time staff, not including faculty who are hired on contract.

## Finances

The overall annual budget for the ITD program is $263,000, which includes major expenditures for air time, salaries for administrative staff and student assistants, and contracts for faculty. It does not include KMCR or Sun Sounds. Support for the program comes primarily from college operational budget and specific external grants.

## Resources Available

Operation manual, student handbook, faculty handbook, sample publicity materials.

Course: Skills for Self-Employment (Owning and Operating a Small Business)

## Observations About Distance Learning

- students need well-organized material that will allow them to progress at their own pace
- once involved in an alternative delivery operation, faculty are supportive and want to continue involvement
- seventy-five percent of ITD students plan to take a regular course at one of the Maricopa campuses
- estimated weekly mileage saved by ITD students is 1 to 20 miles for 37 percent and 21 to 30 miles for 18 percent
- main reason for taking ITD courses is "convenience" for 41 percent and "to try a college-level course" for 14 percent
- distribution of courses over electronic media will become increasingly cost effective as cable television resources expand

## Future Plans

- increase development and production of radio/audio courses
- implement an audio teleconferencing system
- implement a dial-access system
- increase use of computer-managed instruction using microcomputers
- explore the use of microcomputers for computer-assisted instruction
- provide services to inmates of a new prison being completed soon

## Contact Persons

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# ST. AUGUSTINE'S COLLEGE

### Noteworthy Features

- uses computer-assisted instruction to provide academic and job search skills to welfare recipients
- serves nontraditional learners who are not enrolled in college at on-campus learning centers
- enables some welfare mothers to complete GED and enroll as regular students in technical institutes and colleges or to get jobs

### Problems encountered

- enduring delays in funding that shortened the period of time within which to demonstrate the effectiveness of the approach
- working with some regular campus faculty who find it difficult to make the transition from teaching to managing an instructional program
- institutionalizing a program that serves adults who usually cannot qualify for college level courses

### Observations About Distance Learning

- welfare mothers with relatively low academic skill levels respond very positively to instruction on computer terminals
- most participants adapt comfortably to the computer terminals in one to four hours
- many participants come back after regular classes to get more time on the computer terminals
- coming to a college campus for courses is a positive motivational experience for these nontraditional learners
- the computer-assisted management capability of the PLATO system may be more sophisticated than necessary for students at this level
- staff without previous classroom experience often learn the role of instructional manager more readily than those accustomed to teaching
- such programs need to have well-designed print materials for the off-line instructional periods

### Future Plans

- adjust program design to provide

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## Telecommunications Program

College Outreach Computer Consortium

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## Educational Mission

The purpose of the College Outreach Computer Consortium is to provide instruction in basic skills and job search skills as well as to assist in job or educational placement for persons who are currently on welfare and receiving Aid for Families with Dependent Children (AFDC). The vast majority of the students are black women in their twenties or thirties whose average reading skills upon entering the program are at the fifth to eighth grade level. The consortium, which is composed of Saint Augustine's College, Shaw University, North Carolina Central University, and Fayetteville State University, was created in 1980. (N.B. This program terminated its services at the end of September 1981 due to lack of funding. Negotiations continued with the Department of Labor regarding future funding.)

## Telecommunications Technologies

The consortium uses PLATO computer terminals and software developed by Control Data Corporation. PLATO is an interactive, time-sharing computer system designed to serve large numbers of learners simultaneously while treating each individually. The computer display terminal is capable of graphics; symbols; alpha-numerics; animation; and rapid, selective display writing and erasing. To accommodate those whose reading levels are very low, PLATO provides a "touch panel," which permits the user to touch a display screen to communicate with the computer, an alternative to typing out responses on a keyboard.

## Curriculum

The consortium program is designed to teach participants how to select a career, search for a job, interview for a job, and maintain a job once hired. The curriculum materials include both computer software and print. Along with the job-related skills, all participants are pretested and then assigned to the PLATO curriculum suited to their current academic skill levels. Those with reading levels between third and eighth grade are assigned to the PLATO basic skills curriculum, which focuses on reading, math, and language. Those scoring above the eighth grade reading level are assigned to the PLATO GED courseware. Approximately two-thirds of the participants are at the basic skill level and one-third are at the GED level. A small percentage enter the program beyond the GED level.

## Faculty Roles

At each of the four educational institutions in the consortium there are four staff persons: an instructor counselor, a recruiter counselor, a student intern, and a program director. Although much of the coursework is on the PLATO terminal, the participants spend one hour working "off-line" with print materials for every hour they spend using the computer terminals. Staff assistance is necessary during both phases of the coursework. The staff role is intended to be that of an instructional manager rather than that of a classroom teacher.

## Delivery System

The 32 PLATO terminals are the heart of the delivery system, but the instructors and other staff are actively involved in assisting participants. Each week the students spend eight hours in classes; their time is divided evenly between the computer and print materials. Class size is limited to 16, so 8 can use the computer terminals at a time.

Even though the students are not enrolled at any of the four colleges of the consortium, the classes are held on campus in classrooms equipped with eight PLATO terminals. In addition to receiving a $4.50 stipend each day for participating in the program, the women have access to day care and transportation services, arranged by the project staff in cooperation with community service agencies. The project staff also provide participants with job placement assistance.

## Enrollment

In the fall of 1981 there were 400 participants, approximately 100 at each consortium college. The program is too new to have data on completion rates.

## Administrative Structure

Saint Augustine's College is the fiscal agent for a grant to the consortium from the Department of Labor. The other three colleges and universities are, technically speaking, subcontractors. A consulting firm called Technical Resources International, Ltd. supervises much of the day-to-day project management. The project involves four staff at each institution plus three staff from Technical Resources International, Ltd.

## Finances

The consortium is financed by a $865,000 grant from the Department of Labor's Office of Welfare Reform. Although originally intended as a one-year grant, the actual period during which funding has been made available is six months. The major telephone time, staff salaries, computer terminals, and support services. Telephone charges constitute a large share of the project's costs because the PLATO terminals are connected via phone lines to a main-frame computer in Rockville, Maryland.

## Resources Available

Report to Department of Labor.

students with more time on the computer terminals
- reduce size of classes to increase even further the program's ability to individualize instruction

## Contact Person

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# SAN DIEGO AND IMPERIAL COUNTIES COMMUNITY COLLEGE ASSOCIATION

**Noteworthy Features**

- operates a television consortium with an informal organizational structure
- financed with institutional contributions based solely on benefits derived by each college during the previous year's operation
- uses an area-wide, dedicated cable education channel capable of reaching half the homes in San Diego County (over 325,000) that has been created by linking 10 cable companies with an ITFS system operated by the county superintendent of schools
- offers bi-level accreditation among the two-year colleges and affiliated universities that makes it possible to offer lower-division, upper-division, or graduate credit for the same television course (with different student assignments)
- treats on-campus classes for television course students as mandatory rather than optional

**Problems Encountered**

- managing a cooperative venture in which too much time is taken up in the process of distributing and returning materials (tapes, print materials, administrative paperwork) for approval by member institutions
- overcoming faculty resistance, an ongoing problem that fluctuates considerably from year to year
- obtaining sufficient funds to finance more local production
- keeping the knowledge and awareness level of college administrators current with the state-of-the-art of using telecommunications to deliver education
- accepting state-wide policies that prevent TV College from enrolling and supporting students in GED and other noncredit and remedial courses, even though such television courses exist and have been aired by the consortium
- enduring unpredictable enrollment fluctuations from year to year

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## Telecommunications Program

TV College

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### Educational Mission

TV College is a relatively informal consortium composed of six community college districts (nine separate colleges) in the San Diego and Imperial counties of southern California. Four upper-division universities in the area also are affiliated with TV College. The purpose of the consortium is to share resources among colleges and universities that offer courses by television as an alternative form of educational delivery. Most of the students are in their early thirties, half are male, and their ethnic and socioeconomic composition closely reflects that of the community as a whole. Approximately 75 percent concurrently are enrolled in one or more on-campus course in addition to television courses. Such statistics are not available for the upper-division and graduate students who take some of the same television courses (with additional assignments) at the four universities affiliated with TV College.

### Telecommunications Technologies

TV College uses a combination of public and commercial broadcast television, cable television, ITFS, video cassettes, and telephone to serve its students. The 10 cable companies in the region are all linked by an ITFS system serving most elementary and secondary schools and community colleges in the community.

### Curriculum

The majority of TV College courses focus on social science and humanities subjects, but there is an emphasis on real estate and business as well. Courses offered for bi-level credit at both the lower-division and upper- (or graduate-division) levels use the same video segments but require different readings and assignments (e.g., the Shakespeare series).

Since its founding in 1968, TV College has produced seven television courses and currently has two in progress. Most of these have used an interview format, in which the faculty host uses guest experts along with new and existing video materials. Normally the faculty member who designs the course (in cooperation with a team of other content experts and instructional specialists) also serves as the on-camera faculty host. Recently there has been an emphasis on using a documentary-style format. TV College generally offers six to eight courses per semester. The curricular offering is a combination of courses produced by TV College and courses leased from other telecourse producers.

### Faculty Roles

Some of the instructors for TV College courses are regular campus faculty, some are adjunct faculty hired on an hourly basis. TV College faculty are involved in the design, production, and implementation of courses. Faculty teach an average of four on-campus class sessions as a part of each course. Unlike most programs offering television courses, these class meetings are mandatory for students. They normally include orientation, review for exams, exams, and special presentations or field trips. Contact with students also is maintained by mail, by phone, and in person during advertised faculty office hours.

### Delivery System

Students register for TV College courses through individual member colleges. Although, in most cases, each college has its own faculty member teaching the course, sometimes the mandatory class meetings of two or more colleges are at a single location. In order to allow students to preview the television courses available each semester, TV College broadcasts television segments of courses for two to three weeks before registration begins. Television segments can be seen in the early mornings, evenings, weekends, and on cable from 6 to 10 p.m. three evenings per week (referred to as "Prime-Time College")

### Enrollment

Enrollment in TV College courses has fluctuated somewhat over the past few years. In 1978-79 it was 2,049 and in 1970-80 it was 1,724. In spite of this decline the overall enrollment trend has been upward, as it was again in the beginning of the 1980-81 academic year. Enrollment figures are based upon the average attendance for the 4th and 10th weeks. The completion rate is approximately 75 percent.

## Administrative Structure

The San Diego and Imperial Counties Community College Association is composed of institutional chief executives and district superintendents. One of its standing committees, which is called the Instructional Telecommunications Committee, initiated TV College and continues to oversee its activities. There is no joint-powers agreement or other formal basis for the consortium. TV College has two full-time and five part-time employees.

TV College benefits from a situation in which the ITFS system linking all levels of education and the 10 cable companies are controlled by the county superintendent of schools. The linkages are already established, and the consortium does not have to deal directly with the cable companies.

## Finances

TV College is a financially viable operation because institutional contributions to it are based upon the financial benefits received from the consortium activity the year before. Since there is no fixed fee to be paid each year, TV College's viability depends on its performance on a year-to-year basis. Individual institutions receive payment from the state based on average daily attendance, since there are no student tuition fees at the community college level in California. The consortium does receive some funds from grants and contracts.

The overall annual budget level for TV College is $63,000. Major expenses include course acquisition and production air time, tape dubbing, and salaries.

## Resources Available

TV College brochure
Courses:
Real Estate Principles
Principles of Real Estate Appraisal
Introduction to Property Management
Culture of Ancient Egypt
Romance of Clay

## Observations About Distance Learning

- highest enrollments often are attained by the courses with lower production costs rather than by the very expensive ones
- students seem to have a different approach to television when viewing for educational rather than for entertainment purposes
- student success factors like motivation, so crucial in the traditional classroom, are equally important in the context of television courses

## Future Plans

- increase reliance on cable rather than on open-broadcast television
- increase the convenience of TV College for students by offering televised programming all night and by having a 24-hour telephone answering service
- explore the possibility of more cable time for educational programming
- explore the possibilities of interactive programming
- explore the potential applications of videodiscs and other technologies
- expand use of other delivery systems including cable radio and correspondence

## Contact Person

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# SAN DIEGO STATE UNIVERSITY

## Telecommunications Program

Televised Educational Growth Opportunities (TEGO)

### Educational Mission

TEGO provides noncredit televised educational programming for older adults in the San Diego metropolitan area. All courses are selected, developed, and (with only a few exceptions) taught by the older adults themselves. Approximately 40 percent of the students are 60 or younger, 40 percent are between 60 and 70, and 20 percent are over 70. The composition of this group of older adult learners generally reflects the local community population, but the group does have slightly fewer minority and male participants.

### Telecommunications Technologies

Programming is available over a local cable channel as well as a public broadcast television station. Telephones are used for live call-in segments of programs.

### Curriculum

TEGO's curriculum includes a combination of liberal arts and enrichment subjects along with more applied-knowledge topics; these include coping skills. TEGO's curriculum is adapted from the Educational Growth Opportunities (EGO) program, which has offered courses by and for older adults since 1976 and has served an average of 2,000 older adults per term. It was the inability of the EGO program to reach homebound and geographically distant seniors that led to the development of TEGO in 1979.

Two courses are televised during each of three eight-week terms, and one course is offered during the summer term. Course subjects include health care for seniors (with doctors answering questions on the air), legal problems for seniors, social services, tracing your genealogy, mental health, zoos and evolution, local museums in Balboa Park, understanding your investments, and San Diego history. Students who register for courses receive a packet of printed information that includes summaries of the television segments, additional narrative material, a bibliography of suggested readings, and related reprints or brochures on the topic.

### Faculty Roles

The faculty of TEGO are the older adults themselves. A few instructors have been younger than 55, but the majority of courses are taught by local seniors who have expertise in course subjects. Since most faculty previously have taught their respective courses as part of the classroom-based EGO program, they merely adapt them to the television format.

### Delivery System

TEGO classes are televised live in a studio before a group of older adult students. The format may vary from lecture to panel discussion to interview, but it always includes a 15- to 20-minute live telephone call-in period in which the studio class participates. Interaction between telephone callers, the studio class, and the instructor often continues long after the scheduled one-hour television session ends. Most San Diego-area senior citizens seem to view the programming at home, but some do make use of the group viewing sites at the EGO offices and the Chula Vista Public Library.

The televised sessions also provide the telephone numbers of the EGO office, the instructor, and any community agencies that might serve as resources on the respective topic. Seniors who complete the course and send in their course evaluation forms are given certificates. There are no exams or class assignments.

### Enrollments

Judging from the sales of print packets ($2.50 each) and the number of telephone call-ins, roughly 200 seniors view all eight classes in a given series and participate actively in the course. This, of course, varies according to the subject matter. Those who watch one or several classes in a course number in the thousands.

### Administrative Structure

TEGO is the television version of the Educational Growth Opportunities program, which is the senior citizen component of San Diego State University's College of Extended Studies. The television components are produced in cooperation with KPBS-TV, which is licensed to SDSU and located on the campus. The EGO staff includes a quarter-time EGO director, a quarter-time TEGO director, a half-time technical person, a half-time secretary, and a quarter-time senior in charge of public relations. Decisions on which courses and which instructors will be included in TEGO are made by a planning committee of 12 seniors from the EGO program, with input from the directors of the two programs.

### Finances

The TEGO program has been supported by two one-year grants from the Fund for the Improvement of Postsecondary Education ($102,000 in 1979-80 and $74,000 in 1980-81). It also has benefitted from in-kind contributions from SDSU and KPBS-TV. Major expenses include production (approximately $10,000 per course), staff time, print materials, faculty stipends, and university overhead. Subsequent TEGO courses have been supported by grants from a local hospital and the local area Agency on Aging.

### Resources Available

Learning packets, individual course flyers, annual report to FIPSE.

### Noteworthy Features

- provides interactive educational programming for older adults
- enables older adults to govern and manage their own educational programming
- uses older adults as instructors
- enjoys strong community support

### Problems Encountered

- overcoming lack of older adult response to programming offered over educational access cable in comparison with other cable channels and public stations
- evolving a successful procedure for integrating the instructor's presentation and the live call-ins

### Observations About Distance Learning

- selecting a good instructor is a crucial factor in the effectiveness of the televised course
- active involvement of older adults in all phases of the program is essential if the programming is to respond to the needs of seniors
- effective publicity is absolutely necessary if older adults in the community are to find out about how to participate in the program
- older adults prefer substantive, intellectually challenging courses

### Future Plans

- become financially self-sufficient
- produce courses that can be used by other communities (minus the local interactive segment)
- experiment with two-way interactive cable

### Contact Persons

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# SOUTHERN CALIFORNIA CONSORTIUM FOR COMMUNITY COLLEGE TELEVISION

### Noteworthy Features

- constitutes one of the largest telecommunications consortia in the United States
- serves a very large student population in southern California
- produces telecourses as well as leasing them from others
- enjoys strong support from local broadcasters
- elicits strong support from member institutions
- places heavy emphasis on providing support services for learners
- reduces substantially the costs of telecourse production and leasing for participating institutions
- involves faculty in all phases of course development
- producing introductory physics course in cooperation with California Institute of Technology

### Problems Encountered

- overcoming faculty resistance; this has diminished over time as more full-time faculty have replaced part-time instructors
- ending a legal relationship with the Los Angeles County schools system that, until 1980, added an extra layer of bureaucracy
- compensating for the lack of lead time from PBS to adequately plan courses around national productions
- learning, as educators, to appreciate and adapt to the needs of broadcasters
- adjusting to the impact of state budget cuts on summer school

### Observations About Distance Learning

- distance learners need explicit, well-organized learning materials that do not leave them with questions on how to proceed
- learners need a realistic orientation to the process of distance learning
- faculty can be encouraged to devise many alternative interactive support activities for distance learners

## Educational Mission

The consortium produces, acquires, and distributes educational media materials on behalf of its 34-member community colleges in six southern California counties. Although there is considerable variation, the majority (60 to 80 percent) of the students who take consortium television courses are not enrolled concurrently as on-campus students. The average student is a working adult in his or her early thirties. The ethnic and sex composition of the television students is roughly comparable to that of the on-campus population. Special efforts are made to serve Spanish-speaking students.

## Telecommunications Technologies

The consortium uses public and commercial broadcast television, cable television, and radio and makes extensive use of telephone for student/faculty interaction.

## Curriculum

Most consortium-sponsored courses are of a liberal arts nature, although some focus on subjects such as business and electronics. All are offered as credit courses. Of the 30 courses offered by the consortium in 1981-82 academic year, 20 were produced by the consortium itself, or by member institutions, and 10 were acquired from national distributors.

The consortium's production capacity enables it to respond to local curricular needs, to control the quality of the courses, and to actively involve local faculty throughout the course development process. Both faculty and student acceptance of the television courses seems to be enhanced by this local control.

The consortium also develops study guides and textbooks for courses it produces and often will expand study guides provided with courses acquired from other sources.

## Faculty Roles

Faculty at all consortium institutions can participate in the course development process, which is managed by a team of three to four faculty selected by their peers and by the consortium staff. Modified drafts of course designs and scripts are circulated to all member institutions for comment by faculty and administrators. This process is overseen by a curriculum committee of whose members at least half are faculty.

Once a course is underway, faculty have the primary responsibility for supporting their distance learners during announced telephone and office hours; optional seminars and field trips; and via mail, newspaper, and radio. A significant number of faculty are devising their own options for student-faculty interaction. Systematic evaluations from peers and students are among the incentives and rewards that encourage such efforts.

## Delivery System

Optional classes, review sessions before exams, and videotape review sessions take place in various on-campus and off-campus settings, depending on the practices of the local community college. Among the off-campus settings used by consortium institutions are public libraries, community centers, military bases, prisons, store fronts, industrial plants, retirement centers, and hospitals. Field trips are often made to museums, concert halls, computer facilities, and natural environments. Students can interact with faculty during optional classes, review sessions for exams, and field trips, as well as in person or by telephone during office hours. At some colleges, faculty conduct radio talk shows with call-ins following the television broadcast; at others, they write regular columns in local newspapers discussing their courses.

## Enrollment

Since the consortium was founded in 1970, over 260,000 southern California residents have enrolled in televised college credit courses offered by consortium institutions. Enrollment in the 1981-82 academic year was 25,210. This figure is based on an average of attendance on the fourth and tenth weeks of the semester. Figures on completion rates vary considerably from institution to institution and from course to course.

## Administrative Structure

The consortium is a nonprofit corporation, and its board is composed of representatives of all the member institutions. An executive committee and a curriculum committee assist the director and her three full-time staff. Rather than maintain a permanent production staff and studio, the consortium handles course production on a project basis.

## Finances

Support for operation of the consortium and its course production comes from member-institution assessment payments based on a combination of the size of the district (number of FTEs) and the number of students enrolled in consortium courses. Fees range from $6,000 to $40,000 a year per institution. The consortium's operating budget runs between $400,000 to $500,000 a year. In addition, the consortium receives the support of contributed television time from 10 stations in the Los Angeles area. Because of its size, the consortium is able to attract this type of contributed service as well as the initial investment capital necessary to support production. Other major expenses include consortium staff salaries; production staff salaries; telecourse distribution; and lease fees for acquired courses, insurance, and promotion.

## Resources Available

Consortial agreement, governance documents, instructors' handbook, production procedures.

*Television Courses:*
Oceanus
The Marine Environment
Understanding Human Behavior
Project Universe
Introduction to Astronomy
Personal Finance and Management
Introduction to Management
Family Portrait
Contemporary Health Issues
The New Literacy: An Introduction to Computers
The Mechanical Universe (coproduced with CALTECH)

- distance learners increasingly want their educational experiences to take place in shorter, more concentrated blocks of time (e.g., weekends)

### Future Plans

- increase the level of production and distribution
- broaden the types of media used to include more cable television and audio
- devise a wider variety of flexible print, video, and audio options for a given course
- develop a computerized system to aid in student feedback and instructional management

### Contact Person

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# STANFORD UNIVERSITY

## Telecommunications Program

Stanford Instructional Television Network (SITN)

### Educational Mission

The Stanford Instructional Television Network provides live broadcasts of Stanford University courses to engineers and other high-technology staff employed by one of 118 business and industrial firms that subscribe to the network. The typical student is male and is either a professional engineer in his mid-thirties with at least a bachelor's and often a master's degree or Ph.D., or is in his mid-twenties and seeking an advanced degree. About one-third of SITN students are enrolled as regular but part-time graduate students. The network also facilitates instructional delivery to other employee groups in these same firms by providing degree and nondegree programs developed and sponsored by the Association for Continuing Education (ACE) which is a nonprofit organization. (A description of ACE is included in this book.)

### Telecommunications Technologies

The network provides interactive real-time broadcasts with one-way video and two-way audio for 12 hours a day using four Instructional Television Fixed Service (ITFS) channels. The return audio communications from the students is transmitted by radio talkback technology. The network can reach sites within a 50-mile radius of the campus. Courses also are videotaped and distributed by mail to company sites outside the broadcast area as part of a special Tutored Video Instruction program (TVI).

### Curriculum

Stanford University courses delivered throught the network are at the graduate level and offered by the 12 different departments of the School of Engineering. In the 1980-81 academic year, these departments provided broadcasts of over 150 different courses. Students participate in one of three categories: (1) the Honors Cooperative Program (about 25 to 30 percent), serving qualified engineers and scientists pursuing Stanford graduate degrees on a part-time basis while maintaining full-time professional employment; (2) the Non-Registered Option (about 25 to 30 percent), for company employees with a bachelor's degree who are not admitted to the Graduate Division or seeking an advanced degree; if admitted, however, a maximum of 18 units may be applied for credit from this NRO category; and (3) Television Auditor Plan (about 40 percent), for employees who may enroll in courses if space permits but who do not receive testing or grading services. Course materials used are identical with those used by on-campus students. For TVI classes, company-provided tutors are approved by the course instructor and attend the video playback sessions to assist students. Most (90 percent) of Honors Cooperative and NRO students take examinations on the campus. Some graduate degrees, such as electrical engineering, may be earned wholly through completing network-delivered courses; others, such as mechanical engineering, require use of facilities available only on the campus and thus require some on-campus participation.

### Faculty Roles

Department chairpersons, individual faculty members, and company liaison staff work with the SITN director to select and schedule courses for broadcast. Many courses that are selected constitute depth requirements for completing a graduate degree, and others respond to high-demand areas of interest to network firms. Some faculty report they prepare more for SITN courses, but most find there is little difference from preparation for non-SITN-delivered courses. SITN degree program students are assigned faculty advisors in the same manner as on-campus students and travel to campus to visit with faculty and advisors and to use the library. To alleviate increases in faculty workloads for some classes, departments receive funds to employ additional teaching assistants and to increase secretarial support. SITN students are as likely as in-class students to interact with faculty via the two-way audio hookup.

## Delivery System

The 118 company members of the network include large- to medium-sized high-technology firms, most of which are located in the "silicon valley" surrounding the Stanford campus: Hewlett Packard, Ampex, IBM, Lockheed, Memorex, Teledyne, Intel, and Xerox. No special course-scheduling procedures are used since it has been found that the professionals served can accommodate most viewing hours in their flexible schedules. A daily courier service distributes class lecture notes to company sites prior to course broadcast. Students at the industrial sites are able to see and hear the faculty members and can also make comments or ask questions during class by using a press-to-talk microphone.

## Enrollment

Since its founding in 1968 the number of company network members and student participants in SITN has grown. For the 1980-81 academic year, an average of 1,800 students participated each quarter, as of the midquarter billing date (the fifth or sixth week of the term).

## Administrative Structure

The SITN is operated by the Stanford School of Engineering, and the director reports to the dean of the school. SITN service requires network membership. SITN employs 16 full-time staff and 35 part-time student staff members who serve mainly as on-campus camera operators.

## Finances

SITN is wholly self-supporting. Network participation requires payment by a firm of a fee based on number of employees. A trial year membership is available for one year at less than the full fee. Installation of a single classroom capable of switching to all four channels with talkback capability costs about $7,900 and, without talkback, about $2,500. Tuition and student fees vary by student category and are composed of three parts: tuition (representing about half the actual instructional cost payable to the university; a matching fee, roughly equivalent to 50 percent of the actual instructional cost, 80 percent of which is payable to the department involved and 20 percent to a reserve account; and a TV surcharge payable directly to SITN. The annual operating budget of SITN is about $400,000, representing approximately 15 percent of the gross revenue generated by SITN.

## Resources Available

SITN has a new promotional packet designed for students, faculty, and companies. Currently, SITN can distribute a packet of materials that includes:

- schedule of classes
- brief descriptive brochure of SITN
- one-page description of the Tutored Video Instruction program
- sample descriptions of several ACE-sponsored programs (an M.B.A. program offered by Golden Gate University, a supervisory skills program, a management development program)

## Noteworthy Features

- provides live graduate and professional continuing education courses in engineering to employees of over 100 businesses and industries
- replicates the in-class experience for engineering professionals with a wide variety of learning needs
- offers live interactive courses over a four-channel ITFS system 12 hours each day
- offers videotapes of live classes to engineers all over the country

## Problems Encountered

- anticipating possible FCC policy changes affecting ITFS channel allocation
- meeting the challenge of providing sufficient support to faculty when class size expands; credit students now take exams on campus to relieve some delays associated with grading services
- accepting the increasing costs of student fees

## Observations About Distant Learning

- engineers taking videotaped courses in small groups (3 to 12 persons) under the guidance of a peer tutor can perform as well as students in the campus classroom

## Future Plans

- explore the use of satellites
- plan for future data transmission over a video signal so class notes can be distributed via the network rather than by couriers

## Contact Person

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# TACOMA COMMUNITY COLLEGE (TCC)

### Noteworthy Features

- utilizes a wide range of electronic and print media to serve learners
- makes extensive use of low-cost technologies, such as a telephone-accessed audiotape system; telephone message phones; and audiotape, videotape, and radio
- makes course material available to shift workers and other learners on a 24-hour-a-day basis by using telephone-accessed audiotapes
- attains an average course completion rate of 83 percent with undergraduate students
- encounters very little faculty resistance because of the active faculty involvement in decisions and the faculty status of the program director
- experiments occasionally with offering the same course in four different delivery modes (television, radio, audiotape, and newspaper), thus enabling staff to assess learner preferences
- enjoys strong support from the college president

### Problems Encountered

- obtaining access to public broadcasting (television and radio) air time which is more difficult than obtaining commercial air time
- obtaining adequate capital to finance improvements in the CBT program
- obtaining good video and (especially) audio courseware

### Observations About Distance Learning

- evaluations of the same course offered over different technologies reveal no significant differences in student preferences or performances
- independent commercial television stations often are more willing to offer educational programming than are public broadcasting stations
- learners prefer 15-minute-long, telephone-accessed audiotapes to longer ones
- learners prefer watching televi-

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## Telecommunications Program

College By Telecommunications (CBT)

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## Educational Mission

The College By Telecommunications (CBT) program at Tacoma Community College uses many technologies to offer lower-division undergraduate courses to a wide range of working adults. Clientele served by the program are, on the average, 29 years old and either employed full-time or, in some cases, unemployed. Since the Tacoma area is heavily industrialized, many of the students (18 percent in 1980-81) are shift workers who are able to continue their education only in a very flexible educational program. Since the program started in 1975, approximately 65 to 70 percent of the CBT students have been women. Recently, there has been a sharp increase in male students (80 percent in the fall of 1981 quarter) and an increase in the number of CBT students who concurrently are enrolled in one or more on-campus courses (70 percent in the fall 1981 quarter). The reasons for these changes are not clear at this time, although they may be related to cutbacks in on-campus class sections. Special efforts are made to serve both handicapped and incarcerated learners.

## Telecommunications Technologies

Students at Tacoma Community College are able to select from courses offered via public, commercial, and cable television, public (FM) and commercial (AM) radio, telephone-accessed audiotapes, and newspapers. In addition, videotapes are available for viewing at libraries and on campus and the telephone is used for informal student-faculty interaction.

## Curriculum

CBT courses include introductory core courses in the social sciences, sciences, and humanities, along with some electives. CBT does not produce any television courses, but does lease courses from national distributors through its participation in the Washington Community College Telecommunications Consortium as well as through ad hoc cooperative arrangements with other institutions in Washington.

The CBT program produces about half the audio/radio courses it uses and leases the rest from national producers. Locally produced audio/radio courses are basically recordings of faculty presentations divided into 15-minute modules; this length seems suitable, given students' span of attention when accessing audiotapes over the phone and given the recording capacity of audio cassettes. Audio courses for 10-week quarter usually consist of 20 to 30 such 15-minute modules, along with study guides, texts, and readings. Audiotapes also are available in college and public libraries.

Audiotapes also are used to accompany courses by newspaper. Some of these tapes are acquired from national producers, but most are produced locally and include discussions of the course topic by a group of experts. Newspaper courses usually include four to five hours of audio programming that can be accessed by telephone or in libraries.

In the average quarter, students at Tacoma Community College can choose from the following array of courses and delivery modes:

| *Courses* | *Available Modes of Delivery* |
|---|---|
| three television courses | commercial, public, and cable television and videotapes in the college resource center and in public libraries |
| one radio course | commercial AM and public FM radio, telephone-accessed audiotapes, and audiotapes in libraries |
| three audio courses | telephone-accessed audiotapes and audiotapes in libraries |
| one newspaper course | newspaper, telephone-accessed audiotapes, and four one-hour monthly television programs |

## Faculty Roles

Tacoma Community College faculty are involved in the selection, production, and delivery of telecommunications courses. All faculty at the college are invited to review videotapes and audiotapes of courses being considered for lease from national distributors. Local faculty have full responsibility for the content of courses produced by CBT. In addition to scheduling office hours for telephone and face-to-face interaction with students, faculty hold five optional seminars per 10-week quarter in which they discuss the course material with the students. Most classes are taught by full-time TCC faculty, but adjunct faculty also are used occasionally. Part-time and full-time TCC faculty voluntarily teach media courses at a nearby women's prison.

## Delivery System

Besides being able to take courses over a variety of television and radio outlets in the area, CBT students can use the telephone-accessed audiotapes (for radio, audiotape, and newspaper courses) either by dialing a special telephone number from 10 a.m. to 9 p.m. or, if they have touch-tone telephone, by dialing directly any time, day or night. The caller can access specific audiotapes by adding a designated extension number after dialing the automatic system. Each of the eight tape machines is automatically rewound for the next caller. Students can also call in to a message phone on a 24-hour-a-day basis to leave messages for faculty or staff. The CBT program receives over 4,000 phone calls per month to these telephone-based services. Both faculty presentations and examination review material are available on the audiotapes. These telephone services are especially popular with shift workers.

Access to the program's services is facilitated by a flexible registration policy. Students can register by mail, telephone, or in person. Students can attend optional classes (five each quarter), listen to audiotapes of each session, or review audio/video tapes at any of the six CBT sites: two public libraries, two off-campus centers, a women's prison, and the college campus (classrooms and library). Full-time TCC faculty normally are available for informal meetings with groups of CBT students four hours each week; they also keep regular office hours during which individual telephone or face-to-face student/faculty interaction can occur. Letters are sent out to all CBT students each month reminding them of examinations, optional seminars, and other related information.

## Enrollment

In the 1980-81 academic year the College by Telecommunications program had 545 enrollments as of the tenth day of each quarter. The average completion rate for CBT students is 83 percent per quarter.

## Administrative Structure

The College By Telecommunications program is under the direction of the media systems coordinator, who reports to the director of learning services. In addition to TCC faculty who teach in the CBT program and are paid by their respective departments, the program has a three-quarter-time director, who teaches three of the classes, and a half-time work-study student.

## Finances

The overall budget for the CBT program is $45,000. Funding is derived from the institutional budget and is indirectly related to FTE generated by the program. Major expenses include staff salaries, part-time faculty salaries, course leases and fees, consortium fees, and tape acquisition and duplication. Commercial television and radio time are made available at no cost to the program.

## Resources Available

Program description

sion at home to viewing videotapes at learning centers

- faculty-initiated phone calls to students who do not attend optional seminars or examinations or who fail to review tapes are very effective in increasing the rate of course completion
- faculty acceptance of telecommunications programming is enhanced when the program director is a teaching faculty member

### Future Plans

- offer enough courses for students to obtain the A.A. degree via telecommunications
- experiment with video and audio teleconferencing as part of a national project conducted by the Domestic Policy Association and the University of Southern California
- experiment with audio teleconferencing credit courses on the University of Washington's statewide network (WETNET)

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# TO EDUCATE THE PEOPLE CONSORTIUM (TEP)

### Noteworthy Features

- disseminates nationally a proven model for providing formal education to working adults
- combines central staff leadership with collective responsibility for funding, curriculum revision, and some management functions in a national consortium of institutions
- uses the same basic curriculum in two- and four-year public colleges
- uses television courses to deliver a substantial portion of a baccalaureate degree program
- uses national resources and contacts to help educators at local institutions develop programs to serve working adults
- decentralizes some of the logistical and managerial tasks (e.g., book distribution) of the consortium to institutions in different regions of the country
- has gained acceptance among teachers' unions for a delivery system that uses television courses in combination with face-to-face sessions
- builds on the existing interpersonal relationships working adults have within their unions, workplaces, churches, and community organizations rather than merely providing access to higher educational institutions for individual working adults
- researches and evaluates the impact of the TEP model on working adults and their families
- employs an elaborate pay-back system in which the consortium attracts funds which are regranted to local institutions as risk capital for program development and then eventually transferred (in equivalent funds or services) to other consortium member institutions
- has supported the development of television course with tuition-generated funds rather than with large grants or outlays of risk capital

### Problems Encountered

- devising workable procedures for

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## Telecommunications Programs

Consortium programs, are, or will soon be, underway at the following institutions:

California State College (Pittsburgh, Pennsylvania area)
California State University-Dominguez Hills
California State University-San Jose
Cleveland State University (Cleveland, Ohio)
Edinboro State College (Erie, Pennsylvania)
Harbor College (Los Angeles, California)
Longview Community College (Kansas City, Missouri)
Minneapolis Community College
State University College (SUNY)-Brockport, New York
State University College (SUNY)-Buffalo, New York
University of Minnesota
University of Missouri (Kansas City)
University of Oregon
University of South Florida (Tampa)
University of Wisconsin (Oshkosh)
Wayne State University (Detroit, Michigan)
Webster College (St. Louis, Missouri)
West Chester Community College (Philadelphia, Pennsylvania area)

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## Educational Mission

The purpose of the To Educate the People Consortium (TEP) is to disseminate the TEP model for providing higher education to working adults that was originally developed at Wayne State University as the University Studies and Weekend College Program (US/WC). (A separate, detailed description of this program is included in this volume under the listing Wayne State University.) The consortium is a cooperative venture of colleges, universities, labor unions, television stations, and adult and labor education centers. It is designed to be a decentralized consortium, with funding and various consortial administrative functions handled primarily at the local level.

The TEP model is designed to make it possible for working adults who have not traditionally had access to higher education to be full-time students and to be able to complete their bachelor's degrees in a four- to five-year period. To achieve this, an interdisciplinary curriculum in the Meiklejohn, Hutchins, Columbia general education tradition has been adapted to respond to the type of life experiences most working adults bring to postsecondary education. The delivery system for this curriculum combines required television courses, weekend conferences, and small-class workshops. Its organizational structure attempts to integrate the requirements of such a curriculum and delivery system into the framework of the traditional college or university.

Like the clientele served by the Wayne State University US/WC model, student participants in TEP programs around the country include blue-collar, pink-collar, and lower-level management (e.g., foremen) employees. However, compared with US/WC, the clientele of TEP programs include fewer blue-collar workers and more women (50 percent versus 45 percent). The average age of students in both programs is 35. The characteristics of clientele at TEP member institutions vary, depending, in part, upon which membership or employment organizations the educational institution cooperates with to identify students (e.g., union, company, American Indian center, church, housing authority).

## Telecommunications Technologies

TEP institutions use various technologies to deliver the television courses that are an integral part of the TEP model. These include public and commercial open broadcast television, cable television, and videotapes. The telephone also is used to facilitate interaction between students and faculty.

## Curriculum

The TEP curriculum has a definite structure and educational philosophy, but it is flexible enough to be adapted easily to the needs of different universities and communities. Like its US/WC parent model, it takes an interdisciplinary approach to general studies, allowing concentrations in social science, humanities, and science and technology. There is considerable variation from one consortium institution to another in the way the TEP curriculum is adapted to local circumstances. Most participating institutions use the television courses developed by US/WC at Wayne State University. Many institutions use these courses (video segments and print materials) just as they were originally produced; others make local adaptations, substitutions, or even deletions.

There is even more variation among consortium members in their approaches to the other two-thirds of the TEP curriculum—the weekly workshops and the weekend conferences. In some cases, TEP format courses use previously approved course names and numbers to facilitate program implementation. Often, locally developed print materials and commercially available textbooks and books of readings are used as supplements to, or instead of, the original US/WC print materials. Efforts are underway to devise cooperative arrangements for developing and sharing courses among TEP member institutions.

## Faculty Roles

There also is great variation in the roles played by faculty at TEP member institutions. In many cases, the same faculty member does not evaluate student performance in all TEP courses during a given semester or quarter, as is the case in the US/WC program. Since the TEP program at most institutions does not have its own separate faculty and degree-granting authority, as is the case with the US/WC program, faculty often teach TEP courses in addition to other courses assigned by their discipline-based departments. Some institutions use a mix of part-time and full-time faculty in their TEP programs. Regardless of the exact nature of the role faculty play in various institutional adaptations of the TEP model, in their formal and informal contacts with working adults they serve as primary intermediaries between the world of academe and the world of work.

## Delivery System

At the local institutional level the delivery system also takes many forms, depending on the characteristics of the university, the specific needs of the working adults served, and local adaptations made in the TEP curriculum. The consortium staff encourage member institutions to provide as many opportunities as possible for the working adult students to interact with faculty. The staff also encourage participating institutions to actively recruit working adults through cooperating membership organizations (e.g., unions) and to make support services like counseling, tutoring, and class registration available at convenient community sites.

## Enrollment

Overall enrollment in the 12 active TEP member institutions was approximately 2,300 in the 1980-81 academic year. Information on completion rates is not yet available.

## Administrative Structure

The To Educate the People Consortium is a relatively informal cooperative effort among institutions and organizations committed to providing educational opportunities for working adults. It is an expanding entity that includes fully operating programs as well as pilot programs.

There is no formal written agreement that all participating institutions sign, but some formal contracts have been made among member institutions participating in specific activities. Institutions that put up funds to buy the rights to use the US/WC television courses, thereby providing the consortium with much of its initial working capital, signed a contract. Member institutions participating in the Fund for the Improvement of Postsecondary Education (FIPSE) grant to encourage dissemination of the TEP model by sharing a pool of risk capital signed a contract indicating what they would do with their share of the money and how, in turn, they would contribute funds or services to other consortium members.

The only formal governing group is the Organizing Committee, which consists of one person and an alternate for each participating institution or organization, plus an elected chairperson. These representatives also work in committees to supplement the TEP staff. The consortium holds national meetings at which administrators and faculty of participating and prospective institutions and organizations focus on organizational and curricular issues.

TEP has a small central staff, that includes three full-time and three part-time employees. As the consortium expands, the plan to sharing responsibility for funding, curriculum, and management among all institutions participating in the consortium

- adapting an existing curriculum and delivery system to the diverse academic, financial, and administrative policies of different institutions
- dealing with people who are unfamiliar with the original Wayne State University US/WC model
- getting people to understand the unique curricular structure and delivery modes of the TEP model
- overcoming the effects of rapid turnover in local program staff
- financing the costs of revising and updating television courses
- obtaining enough videotapes of the correct formats to circulate among TEP member institutions
- administering the distribution of books and print materials in the face of different institutional calendars, course offerings, and purchasing practices as well as fluctuating book supplies
- overcoming the limitations of being able to afford only a small central staff

## Observations About Distance Learning

- many educational institutions lack the ability to take advantage of opportunities for educational innovations requiring decisive action, risk capital, or new procedures
- once the creation of a new program for working adults is announced, it is essential to get them involved quickly rather than to keep them waiting
- many working adults drop out because of financial problems
- television courses work well as part of a delivery system for working adults
- working adult students seem to respond more to the quality of course content than to the level of technical sophistication of television courses
- if given some training, a high percentage of regular campus faculty are able to effectively teach

and relate to working adults
- regardless of their aspirations for upward mobility, most working adults see education as a valuable outcome worth pursuing

### Future Plans

- revise and improve television courses
- regionalize TEP management into eight regions
- expand the consortium to include more institutions

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decentralize its major functions (e.g., book distribution, evaluation/research, television development, television dissemination) to institutions in different regions of the country gradually is being implemented. Wayne State University serves as the fiscal agent for the consortium.

## Finances

TEP is financed through a combination of consortium-wide and local income-generating activities. In keeping with its decentralized approach to collaboration, TEP institutions each attempt to finance their own local activities in ways that also enable them to contribute some service(s) to the consortium as a whole. In addition to tuition income, some member institutions have attracted funds from local foundations and from state legislatures to assist in program development.

TEP has received grants to support consortium operation and program development and dissemination from FIPSE ($400,000) in declining amounts over a three-year period from 1979-80 to 1981-82) and the National Endowment for the Humanities ($320,000). Of these amounts, approximately 80 percent has gone to support the initiation of TEP programs at local institutions. The rest has been used to cover TEP central administration expenses and indirect costs to Wayne State University. TEP also has received $22,000 from The National Institute for Education (NIE) to research the impact of parents' participation in US/WC on the schooling of their children. Institutions with operating programs pay $200 a year in membership, and pilot programs pay $100.

Major TEP expenses include support to new member institutions, television course copyright payments to Wayne State University, annual meetings, program evaluation, and staff salaries. The overall operating budget for the central staff is approximately $70,000 per year.

## Resources Available

*To Educate the People; An Experimental Model for Urban Higher Education for the Working Adult,* occasional papers.

# TRINITY UNIVERSITY, DEPARTMENT OF HEALTH CARE ADMINISTRATION

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## Telecommunications Program

Non-Traditional Practice-Based Graduate Program in Health Care Administration

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### Educational Mission

The program seeks to increase access to the master's degree program in health care administration for practicing professionals working in health care settings in Texas and other locations throughout the United States. Students are older and have had more professional experience than those in the on-campus program; about one-third are administrators, one-third are associate or assistant administrators, and one-third are department heads in hospitals. Two-thirds of the students are located in sites outside Texas (i.e., Alaska, California, Georgia, Rhode Island), and one-third are located in Texas. About 90 percent of the students are men. Those served by the off-campus, practice-based program cannot enroll simultaneously in the on-campus program.

### Telecommunications Technologies

The program makes a periodic use of a two-way, live audio teleconferencing system that uses telephone lines to simultaneously link the campus classroom with student home or office locations. The system allows for interaction between the instructor and the student and between the students themselves. Teleconferencing sessions are coordinated through the Darome Connection, a company specializing in interactive audio equipment and bridging services.

### Curriculum

The four-year master's program in health care administration includes 15 credit courses. All courses originally were developed by Trinity faculty and modified for application to the work settings of the off-campus students. Since the program is basically an individual-study program, considerable use is made of printed material specially developed for the off-campus student, including reading assignments, project assignments, and study guides.

### Faculty Roles

Although faculty receive no special training in the use of the teleconferencing equipment, brief orientation sessions are conducted prior to the start of the term. It has been found that faculty learn what they need to know quickly through trial and error. The department chairperson serves as advisor to students in the program and is available by phone and in person. For two full days at the beginning of each six-month term, students attend on-campus course meetings with faculty and other students, review workloads for the term, receive course materials, and become familiar with the telephone hook-up options (i.e., home or worksite) available to them. Each faculty member teaching a course is responsible for developing course content. Once a month, two hours per course, faculty use the teleconferencing system to discuss recently completed assignments with the students.

### Delivery System

All students must spend two full days on campus at the beginning of each six-month term to meet with faculty and other students and review course objectives. To participate in the once-a-month teleconferencing assignment review sessions, students either may come to the special on-campus classroom or arrange to link their home or work telephones to the teleconferencing system. Students may converse with one another or with the instructor via the system. Faculty are available for individual consultation at scheduled telephone hours. Most students have access to some type of speaker telephone system at their own hospital; some purchase such devices for use in their homes.

### Enrollment

The first class of 27 students entered the program in May 1978. During 1979-80, 32 were entered. Attrition for the first entering class was high (66 percent) due to several factors: students' movement to new jobs, inability to secure student tuition funding, and failure of students to develop regular study regimens. Significant changes were made in the program between the first and second year, and the attrition rate for the second class has been low (less than 10 per-

### Noteworthy Features

- serves employed professionals from all over the country with a nontraditional graduate external degree program
- uses audio teleconferencing on a national scale to provide health professionals with interactive learning opportunities
- facilitate interaction of off-campus students working in the field with on-campus students; this has proven very beneficial to the latter
- brings a national perspective to bear on course issues and content because participating students are working in health care organizations throughout the United States

### Problems Encountered

- diminished supervisory control of the faculty over the students' learning experience (i.e., students are part-time and periodically face interruptions because of family or work demands)
- absorbing the costs associated with audio teleconferencing on a national scale
- finding a time for teleconferencing sessions that is convenient for students located in five time zones

### Observations About Distance Learning

- the students' ability to apply immediately what they learn in the classroom greatly enhances their learning experience
- mature students are more discriminating about what learning is useful
- students who have had practical work experience are highly able and motivated learners

### Future Plans

- extend instructional services to alumni of the health care administration program
- purchase teleconference bridging equipment
- extend teleconferencing to other continuing education programs

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cent). The program will continue to admit no more than 35 students per year; as of the fall of 1981, there were 82 students enrolled.

### Administrative Structure

The program is located in the Center for Professional Development in Health Administration, a unit in the Department of Health Care Administration of Trinity, itself located in the Division of Business and Administration Studies. The program is served by a full-time administrative assistant and a secretary, in addition to its director.

### Finances

A Kellogg Foundation grant was used initially (1976-80) for course development and administrative staff costs. The current $100,000 annual budget is generated from student tuition and is a part of the departmental budget. Major expenditures include teleconferencing equipment and bridging services, long-distance telephone costs, staff salaries, and supplies (including extensive mailings to students). Students pay between $36 and $40 per month for their home or office telephone installation and use.

### Resources Available

Several short, printed documents that describe both the teleconferencing system and the advanced degree program.

# UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN, COMPUTER-BASED EDUCATION RESEARCH LABORATORY

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## Telecommunications Program

PLATO Corrections Project (PCP)

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### Educational Mission

The PLATO Corrections Project, PCP, begun in 1975, provides inmates of Illinois adult correctional facilities with access to basic skills instruction—both a pre-GED and a GED curriculum—as well as to additional instruction in several vocational and a few advanced academic areas. All current learners are males who typically are in their twenties, economically and educationally disadvantaged, and likely to be members of a minority group. Since many have had very negative previous experiences with formal education, an additional purpose of PCP is to increase motivation to learn.

### Telecommunications Technologies

PLATO is an interactive, computer-based education system designed to serve large numbers of learners both simultaneously and individually. The computer terminal display is capable of graphics, symbols, alphanumerics, animation, and rapid selective display-writing and erasing. To accommodate those whose reading levels are very low, PLATO provides a "touch panel" that permits the user to touch a special display screen to communicate with the computer as an alternative to typing out responses on a keyboard.

### Curriculum

The set of 700 pre-GED and GED PLATO lessons, representing more than 10,000 hours of instruction, provides mastery-based instruction in reading comprehension, mathematics, and language skills to prepare individuals for the GED examination. Each lesson represents about 30 minutes of instruction and includes an "off-line" (e.g., time off the computer) set of work materials that complement the on-line lessons. Instruction is computer-managed; that is, each lesson includes a pretest, the instructional component, and a posttest. PLATO central staff are the primary developers of the GED lessons, but other PLATO users at the University of Illinois and elsewhere in the state contribute to lesson development. In addition to the curriculum, the PLATO system includes a computer management system, an evaluation mechanism (to monitor student use of the programs as well as student learning progress), and an instructor training handbook (self-instructional).

### Faculty Roles

All schools located in Illinois correctional facilities are part of one statewide school district governed by a school board and administered by a superintendent. Teachers in these schools must meet the same state certification requirements as those in other schools. A teacher is always present to help students use the PLATO system. The local teachers provide a 30-minute orientation session for students, introducing them to the system, use of the keyboard, etc. The teachers also handle routine maintenance of the terminals, and, with assistance from central staff, keep PLATO "on-line" with few interruptions.

Staff from the central PLATO office continuously monitor site-facility operations and student performance via a centrally located computer terminal. Before the PCP begins operation at a new site, PLATO staff bring the teachers at the corrections facility to the central laboratory in Urbana for training, which is facilitated by use of the step-by-step instructor's training handbook. Staff then continue to visit local sites, first every week to two weeks and later on a monthly basis.

### Delivery System

PCP is located in seven Illinois prisons as well as in the offices of the Department of Corrections School District in Springfield, Illinois; PCP also is being used in one juvenile detention center in Illinois and at several Job Corps sites in Texas and Utah, where terminals are used by each individual about 45 minutes to one hour per day, five days a week. There are waiting lists at all prisons for participation in the PCP. The availability of a package of "off-line" instructional materials (i.e., paper-and-pencil math exercises, hard-copy reading materials, etc.) allows more inmates to participate in the program—some work with these materials

### Noteworthy Features

- uses a computer-based education system with an incarcerated population
- uses mastery-based materials for individuals who have been previously "turned off" by formal education systems
- has experienced no intentional damage to any PLATO equipment by inmates since the program began in 1975
- generates a high demand for the program by the inmates (e.g., long waiting lists)
- targets the system to "transitional" students, those whose skills fall between basic education and GED levels
- has an elaborate, built-in capacity for monitoring student use of the system and student learning progress

### Problems Encountered

- dealing with disruption of the instructional program when an inmate is transferred from a facility that offers PLATO to one that does not
- accepting less than maximum use of the terminals because of staffing problems at night (problems associated with moving inmates to and from terminal locations safely)
- overcoming the early challenge of modifying the system to keep inmate students from communicating with one another through PLATO (a built-in feature of other PLATO systems)
- developing a system with which prison teachers could become proficient with a minimum of training

### Observations About Distance Learning

- the individualized, private nature of the learning process provides a setting where learners need not worry about "losing face" in front of fellow inmates, thus affecting their interactions with the teachers (authority figures) and thereby contributing to greater self-esteem

- the range of lessons and learning activities that are part of the PLATO curriculum allows teachers to select from a wide array of learning strategies on behalf of particular students; such flexibility appears to enhance teacher effectiveness
- PLATO appears to have a positive impact on inmate motivation to learn

### Future Plans

- expand the service to all adult and juvenile correctional facilities in Illinois
- expand the service to other special populations, including Jobs Corps participants and those who frequent store-front adult education centers

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while others simultaneously work on the computer terminal. Instruction could take place 24 hours a day and serve more inmates, but prison security and other logistical local-site problems limit use of the terminals primarily to daytime hours.

### Enrollment

From January 1980 to December 1980, 1,931 different individuals used PLATO in Illinois prisons for an average of 23 3/4 hours each (for a total of 45,861 instructional hours). Enrollment and average terminal usage per person have been steadily increasing over the last several years. Only about three percent of those who begin the GED program on PLATO decide to drop out before completing the lesson sequence. Previous studies indicate that PLATO learners do as well or better than their conventional classroom counterparts on the GED examination, and that they spend less time preparing for it.

### Administrative Structure

Ten staff members, most of them full-time, and several graduate students are responsible for both the PLATO corrections and Job Corps projects. The staff is employed by the Computer-Based Education Research Laboratory at the University of Illinois at Urbana-Champaign. The PCP is funded by the Illinois Department of Corrections which retains considerable latitude over project operations. PCP staff work in one of three specialty areas: curriculum development, computer programming, and site implementation (staff training and program monitoring).

### Finances

The Illinois State Department of Corrections currently provides the PCP with total funding, amounting to approximately $300,000 per year. Initial project support (1975) came from the Law Enforcement Commission. Expenses are divided into two equal parts 50 percent for development (primarily University of Illinois staff time) and 50 percent for equipment, phone lines, and computer usage.

### Resources Available

Printed materials that describe both the PLATO system in general as well as the specially developed Corrections Project; Smith, S. G. and Sherwood, B. A., "Educational Uses of the PLATO Computer System," *Science* 192, 344-52, April 23, 1976; Siegel, Martin A., "Computer-Based Education in Prison Schools," *Journal of Educational Technology*, 7(3), 239-56, 1978-79; Siegel, Martin A. *et.al., Executive Summary—The PLATO Corrections Project Computer-Based Education for Adult Inmates*, Urbana, Ill. Computer-Based Education Research Laboratory, March 1977; and Siegel, Martin A., *Teacher's Guide to the PCP Reading Comprehension Program for Adolescent and Adult Learners*, Urbana, Ill. Computer-Based Education Research Laboratory, CERL Report E-3, January 1979.

# UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN, OFFICE OF CONTINUING EDUCATION AND PUBLIC SERVICE—ENGINEERING

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**Telecommunications Program**
Electronic Blackboard Communication System

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## Educational Mission

The electronic blackboard is used as an instructional aid to off-campus learners seeking access to graduate degree engineering, graduate extension, noncredit professional development, and undergraduate credit courses. The typical off-campus student served is pursuing a master's degree in engineering, lives and works 100 to 200 miles from the Urbana-Champaign campus, is 5 to 10 years older than his or her on-campus counterpart, and is employed full-time by private industry.

## Telecommunications Technologies

The two-way audio, two-way blackboard system allows individuals at different locations to both send and receive live pictures of problem-solving exercises. Each location is equipped with one or more electronically sensitive blackboards for transmitting visual images and one or more television monitors for receiving images from other sites. Bell Telephone developed the blackboard system, also known as the Gemini 100, which transmits its signals over telephone lines. A separate audio system makes two-way voice communication possible also.

## Curriculum

The blackboard has been used primarily in graduate engineering courses, which involve extensive problem solving and computational activities. In 1979-80, the 17 University of Illinois courses using the blackboard included engineering, math, and the social sciences (statistics). The courses could be taken for graduate resident, graduate extension, and undergraduate credit as well as on a noncredit basis. Most courses that use the electronic blackboard are simultaneously taught on and off campus, with all students utilizing the same print materials. No special materials are developed for the off-campus students. New courses are scheduled for inclusion in the system based on responses to periodic interest surveys from current and prospective off-campus students.

## Faculty Roles

Only minimal (approximately 15 minutes) training is needed by faculty who use the system. Almost all faculty visit each off-campus site once during the term and offer course sessions from the remote (off-campus) sites. Faculty also use the system for conference sessions with individual student advisees and class members and make themselves available to students during regularly scheduled telephone office hours. Funds are available for course assistants to help faculty with the additional load generated by larger course enrollments.

## Delivery System

The system currently links seven learning sites, including both the Urbana-Champaign and the Chicago Circle campuses of the university, and five private-industry sites throughout the state. Courses may originate from any one of the seven locations and simultaneously reach all other locations. Special advising days are set aside for student/faculty interaction on the system. Each classroom is equipped with at least one electronic blackboard, which enables students to communicate with the instructor, three television monitors, which transmit the instructor's writing, and, finally, a separate audio system for two-way voice communication. All classes are taped centrally and also can be taped at the off-campus sites for later viewing by students. Tapes can be made of both the writing and the audio discussions. Slides also may be used and duplications sent to all off-campus sites. Material distributed in class to on-campus students is mailed in advance to the off-campus sites. The system operates from 8 a.m. to 5 p.m. for regularly scheduled graduate engineering courses and from 5 to 10 p.m. for other courses.

## Enrollment

The electronic blackboard system, begun in 1974, when still under development by Bell Laboratories in 1980-81 enrolled 125 off-campus learners in 17 courses. Class size requirements range from a minimum of 10 to a maximum of 25, including both on- and

### Noteworthy Features

- uses electronic blackboard technology to serve distance learners
- combines off-campus students in industry with regular on-campus graduate students in the same classroom activities
- is relatively less expensive than a two-way video system or a conventional classroom format requiring faculty to travel to remote sites

### Problems Encountered

- communication failures periodically interrupt service to one or more off-campus sites (though tapes may be viewed later to fill in any gaps in the course session)

### Observations About Distance Learning

- faculty teaching styles and system capabilities must be compatible
- the learning experiences of on-campus students are enhanced by interaction with the older, more experienced, off-campus students

### Future Plans

- expand both the number of off-campus learning sites and the number and variety of courses offered

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off-campus students. Enrollment has doubled since 1978, growing in direct proportion to the number of off-campus sites available. Retention is reported to be 100 percent, in large part due to the careful counseling of students before they begin a system course.

### Administrative Structure

The system is administered by the Office of Continuing Education and Public Service-Engineering, supported by a full-time director, who is half-time with Continuing Education and half-time with Engineering, and by a full-time electronics technician. No special committee or advisory structure exists to govern the system, although close communication with both employers and employees at the private-industry sites is maintained.

### Finances

As with other continuing education courses, the system is supported primarily by student fees and state general-fund monies. Some courses, though, are financed under contract with outside agencies. Student fee rates are established on the basis of what it would cost to support an instructor who traveled to the off-campus site to teach the course. Individual remote learning site sponsors (i.e., the five industry sites) pay either Illinois Bell Telephone Company or the University of Illinois to lease the needed technical equipment and pay for on-line time. Blackboards cost $5,000 to $6,000 each to lease, and cost of operating a remote center ranges from $15,000 to $20,000 a year. No soft money supports the system, and the budget is part of the continuing education budget of the university. Major expenses include administrative and technical staff salaries and equipment leasing and maintenance for on-campus electronic blackboard classrooms.

### Resources Available

A full description of the Gemini 100, the electronic blackboard system, is available from the Bell System; a program schedule is available from the university.

# UNIVERSITY OF MARYLAND UNIVERSITY COLLEGE

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## Telecommunications Program

Open University (OU)

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### Educational Mission

The Open University program at the University of Maryland University College began in 1972 as an experimental attempt to transplant the delivery system and course materials of the British Open University (BOU) to American universities. Open University courses at Maryland, as is also the case in Britain, are designed for adults who prefer studying on a part-time basis at home without having to spend large blocks of time in classes. Guided study courses, as they are called at Maryland, are designed for adults who want structured undergraduate education offered within a flexible delivery system.

The profile of the Open University student closely parallels that of the average Public Broadcasting Service viewer. Students tend to be in their late twenties or early thirties, 55 to 60 percent are female, most have taken college courses before, and most are currently employed on a full- or part-time basis with family incomes in excess of $20,000. Most are part-time students. Participation by minority ethnic groups tends to be somewhat below that of University College as a whole. Approximately 5 percent are enrolled concurrently in other University of Maryland courses. Because the design of the Open University curriculum and delivery system assumes a high level of motivation and self-discipline on the part of the students, the program tends to attract and retain individuals with relatively high levels of prior educational attainment.

### Telecommunications Technologies

The Open University relies on public broadcast television, film, video cassettes, and telephone to serve its learners.

### Curriculum

Open University courses fall into four main interdisciplinary categories: behavioral and social sciences, fire science, technology and management, and humanities. Student enrollment in these categories is roughly 36, 6, 43, and 15 percent, respectively. Although students cannot major in a specific discipline such as biology or English through the OU, they can receive a bachelor's degree from University College in behavioral and social sciences, fire science, humanities, or technology and management or by combining OU courses with other University of Maryland courses. The curriculum is interdisciplinary in nature and organized into three-, six- and nine-credit-hour courses—the nine-credit-hour courses require about 20 hours of study per week. Most students take only one course at a time of the 30 to 35 offered each semester.

The OU is a learning system that stresses reading as the primary instructional vehicle. Television and film are used to motivate, pace, and supplement student work. Each course includes print, television or film, and interaction between students and tutors at discussion centers and by mail and telephone.

The print components of each course include a unit text, set texts, and a syllabus. The unit text, or study guide, is designed to be "student-active" by encouraging an ongoing dialogue between the author and the student through self-assessment exercises. The manner in which the unit text leads the student through the course material assumes a high degree of self-discipline and independence on the part of the learner. Set (standard) texts contain the required readings. Information from the unit and set texts often will appear in the self-assessment exercises, written assignments, and final examinations. The third print component is the syllabus which indicates reading and writing assignments for each week and coordinates the television broadcasts with the week's readings. Most courses also include supplementary reading lists.

The video material (television or film) is intended to be used as a motivator and pacer rather than in a didactic fashion. Video accounts for 5 to 10 percent of the course content and print materials make up the rest. The three-hour class sessions each week, which are led by tutors, are meant for discussion and clarification, not as a source of new material.

Initially, the staff of the Maryland OU of-

### Noteworthy Features

- is an American adaptation of the British Open University
- is the model for and cofounder, with the Maryland Center for Public Broadcasting, of the National University Consortium for Telecommunications in Teaching
- places emphasis on print rather than on electronic media as the primary vehicle of communication in a distance-learning delivery system
- places heavy emphasis on written communication for distance learners (essay papers and exams)
- offers distance-learning courses that are part of a coherent curriculum leading to a degree
- uses tutors to help integrate print and video during weekly tutorial sessions and in mail, telephone, and one-to-one communications with students
- makes optional weekly tutorial sessions available for distance learners in small groups
- employs nine-, six- and three-hour credit blocks for courses
- offers students an interdisciplinary curriculum
- enjoys an 87 percent completion rate in an undergraduate distance-learning program

### Problems Encountered

- operating a heavily print-dependent delivery system in a world in which textbooks often go out of print with little or no notice
- working within copyright limitations on video and print materials used for instruction
- managing a registration system that must channel thousands of learners into decentralized tutorial sessions while maintaining minimum session sizes of 10 to 15 students
- managing the logistics of weekly delivery and pick up of video and film hardware and software to 15 or more locations
- accepting the high cost of books for students in a heavily print-based distance-learning system
- updating and revising courses

fered British Open University courses (print and video) with few, if any, changes. They have also developed courses in cooperation with the Maryland Center for Public Broadcasting. When developing courses they may either redesign the components of a related BOU course or design a totally new course. A course development team, composed of a team chairperson, one or more faculty content experts, and at least one tutor, designs and writes the print components and selects the video components from existing film and video materials. If new video material is needed, it is produced by the Maryland Center for Public Broadcasting in cooperation with the OU course team.

In addition to regular courses, students with a junior standing or above can take reading courses under faculty supervision. Reading courses may not duplicate previous course work.

## Faculty Roles

University of Maryland and other local university and college faculty members are involved in the Open University as content experts in the course development process. The weekly three-hour tutorial sessions are conducted by a group of 48 tutors. Approximately 30 percent of the tutors have completed doctoral degrees and the rest have completed coursework toward a doctorate or are specialists in a particular subject. All are hired on a part-time contract basis and most have full-time jobs elsewhere.

In addition to keeping in contact by mail and telephone, tutors assist their students by discussing course content, presented in the print and video materials, during weekly tutorial sessions. Whether or not the video portion of the course is televised, as is the case for approximately one-third of the courses offered each semester, the tutor will spend a considerable portion of the weekly three-hour meeting showing films or videotapes. The tutor's role is to encourage discussion and answer questions, not to introduce new content beyond the print and video components. Courses with more than three sections have a senior tutor designated to serve as coordinator of the tutors for that course. Since all final examinations are of an essay nature and all students must complete 20 to 50 pages of written assignments for each nine-hour course, tutors spend a good deal of time reviewing essays and providing feedback to students. The average class size is approximately 20, but classes with as few as 10 students are staffed with a tutor.

## Delivery System

In addition to viewing 30 minutes of television and/or film every other week and attending one three-hour meeting per week, OU students spend most of their time reading the five to ten books and writing the three or four written assignments required each semester. Even though their attendance is required only at the orientation class and the final exam, approximately two-thirds of all OU students regularly attend the weekly meetings and nearly all attend some of these optional sessions. Students also can contact their tutors by phone or in person. Tutors are encouraged to initiate contact by mail or phone with those students not attending tutorial sessions.

Tutorial sessions are held at 15 on- and off-campus sites around the Washington/Baltimore metropolitan area. All but the smallest courses offer students the opportunity to select a nearby site. In an effort to save time and fuel costs, some meetings are held as all-day Saturday sessions once a month.

## Enrollment

In 1981-82 there were 2,624 enrollments (including summer semester) in Open University courses. Since these are predominantly six- and nine-credit-hour courses this would be the equivalent of two or three times the enrollment in three-credit courses at other colleges. This figure is determined as of the third week of classes during the 18-week OU semester. The course completion rate is approximately 87 percent.

## Administrative Structure

The Open University program is a major component of University College, which is one of the five campuses of the University of Maryland system. University College has responsibility for undergraduate and graduate courses held on weekends and evenings throughout Maryland and in some overseas locations. The Open University has nine full-time and two part-time staff members plus access to the full range of faculty and student services of University College. Assistant directors have primary responsibility for course development revision and management in each of the three major curricular areas.

## Finances

The overall budget for OU is approximately $750,000. This figure does not include costs for course development, which are paid from supplementary funds from University College and amount to approximately $75,000 per year. The program is self-sufficient based on income derived from student tuition. Major expenses include acquisition of video materials, printing, tutor travel, staff and tutor salary, space rental, indirect costs, and overhead.

## Resources Available

Examples of unit texts, syllabi, student and tutor guides.

Courses: Some Open University courses are available through the National University Consortium of which the OU is a founding member (see NUC description in this book).

- dealing with the desire of tutors to introduce new content material while interpreting the existing material at weekly sessions

## Observations About Distance Learning

- most students appreciate the sense of collegiality they find in tutorial sessions and like having the option to attend or not attend these sessions
- some students have a strong preference not to attend tutorial sessions
- students appreciate the mix of structure and flexibility offered by the Open University
- distance learners who persist are very highly motivated and self-disciplined
- students give OU staff loud and clear feedback on any problems in the program
- paying course-development teams based on product produced, rather than on time spent, yields better results
- word of mouth from students is the most effective way of promoting the program

## Future Plans

- increase the flexibility of the OU delivery system
- experiment with more student/tutor interaction by telephone

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# UNIVERSITY OF MID-AMERICA (UMA)

## Telecommunications Program

[In June 1982, prior to publication of this book, the Board of Trustees of the University of Mid-America voted to dissolve the UMA corporation and postpone indefinitely plans to create an American Open University due to lack of funding. National Institute of Education funding ended as of October 1, 1982. This description was written prior to this decision.]

The University of Mid-America involves programs that use telecommunications to deliver education at the following member institutions:

Iowa State University
University of Iowa
Kansas State University
University of Kansas
University of Minnesota
University of Missouri
University of Nebraska
North Dakota State University
University of North Dakota
South Dakota State University
University of South Dakota

## Educational Mission

The University of Mid-America is a regional consortium that, since its founding in 1974, has been developing and experimenting with educational alternatives for adults who are unable to take advantage of existing postsecondary educational opportunities. It originally evolved from the State University of Nebraska project, called SUN, which combined the resources of Nebraska Educational Television and those of the university to serve the educational needs of adults. At the urging of the staff of the National Institute of Education (the SUN project was originally funded by the U.S. Office of Education until NIE, created in 1973 took over funding) the SUN project was expanded into a regional consortium known as the University of Mid-America. This consortium now includes 11 universities in seven states.

The evolution of this experimental educational program continues to this day. The University of Mid-America is currently in the process of becoming the American Open University (AOU). This involves not only expanding its entire mission to a national scale but also altering its organizational framework and educational services.

Plans call for the AOU to be governed by a broadly representative board of trustees from higher education, business, labor, the telecommunications industry, the military, and private philanthropic organizations. It will offer adult learners a broad range of services that will include educational advisement, assessment, advocacy, credit banking, credit transfer, and instruction. The AOU is intended to respond to the needs of the large number of adults (over 18 million according to the 1980 Census) who have accumulated some college credit but have not completed a B.A. degree. The AOU will help learners in this category who want a B.A. degree to combine transcripts of previously completed courses with credit by examination, credit for assessed prior learning, current instruction from colleges and universities as well as flexible instructional options offered by the AOU itself.

AOU faculty, organized around concentrations in arts and sciences, business, and science and technology (primarily engineering and computer science), will offer independent study courses employing both print and electronic media. Faculty also will define curricular standards, assess and evaluate student performance, and make recommendations for the granting of degrees. The support staff will include instructional designers, evaluators, researchers, technologists, counselors, and advisors. The transition from UMA to AOU is scheduled to take place in October 1982 when NIE's current grant support for UMA is scheduled to terminate. (The remainder of this description will focus exclusively on UMA and the services it has provided from 1974-82.)

The educational mission of UMA has involved four major categories of activity: (1) developing multimedia college-level courses for study at home; (2) research on adult learning, evaluation of learner response to open-learning courses, and dissemination of research results; (3) assistance for the consortium members in their development of open-learning delivery systems; and (4) distribution of course materials to institutions nationwide.

From 1973-82 the open-learning delivery

systems of UMA institutions have processed nearly 20,000 enrollments; nearly two-thirds are for credit courses. The majority (75 percent) are women working as homemakers and/or in professional, technical, and related jobs. The average age is 36; 7 percent are less than 25 and 44 percent are over 40 years of age. Most have some formal training beyond high school and over 40 percent have already completed a bachelor's degree or more. Over 90 percent classify themselves as "white." UMA learners live in a broad cross section of rural and urban communities in the seven participating midwestern states. Figures on concurrent enrollment in traditional on-campus and UMA open-learning courses are not readily available.

## Telecommunications Technologies

The delivery systems of UMA member institutions use various combinations of broadcast television, cable television, FM radio, videotapes, audiotapes, and telephones.

## Curriculum

Since UMA itself offers neither credit nor degrees, its curriculum consists of courses offered by the participating universities. However, approximately 40 percent of the telecommunications-based courses these universities use to reach off-campus learners have been developed in conjunction with UMA. The majority of these are undergraduate liberal arts elective and core courses; UMA also has developed courses in the business, agriculture, and personal enrichment fields. UMA courses for the distant learner combines broadcast and cable television, radio, video cassettes, and audio cassettes, study guides, textbooks, and popularized materials for newspaper publication.

In developing its courses, UMA has used a course team approach modeled after the strategy employed by the British Open University. Based on the principle of collegial collaboration and review, the UMA team approach assumes that the production of a high quality multi-media course for adult learners requires the expertise of professionals representing a number of discipline areas and that a group of such qualified individuals can develop a better multi-media course than one individual. Faculty and staff from member universities participate in this team process, but final decisions remain with the UMA central staff.

UMA course development teams generally involve four different types of persons: the content expert, the instructional developer, the television producer, and the formative evaluator. The content expert, who may be assisted by other scholars in the field, is usually on leave from an academic appointment at a college or university. He or she has primary responsibility decisions concerning the level, scope, objectives, accuracy, and overall quality of the course content.

The instructional developer, who is typically also the team leader and manager, is responsible for managing the team's internal cooperation, its budget expenses, its working procedures, and its interfacing with other organizational units of UMA. In addition to overall supervision of the process of translating the course objectives into a finished course, the developer usually takes primary responsibility for writing the study guide and administrative guide that will accompany the course.

The television producer supervises a staff that includes scriptwriters, production assistants, directors, and film crews. The formative evaluator's role is to provide the rest of the team with information that can improve the quality of the course production. The evaluator may obtain student reaction to portions of the course, compare objectives and outcomes, monitor team activities and materials for problems, and, in general, support the team effort with constructive suggestions for improvement.

In most cases video materials for UMA courses are original productions. However, some courses have been based, at least in part, upon video or film resources developed by UMA member universities.

Because UMA distance-learning courses rely so heavily on print material to convey content, they seem to be viewed favorably by on-campus faculty. Early UMA courses included as many as 15 half hours of video, but gradually evolved to an average of only 6 half hours of video per course because research indicated heavy reliance on video was not always necessary or cost-effective.

### Noteworthy Features

- constitutes one of the largest single experimental programs designed to encourage distance learning
- supports the delivery of distance-learning courses to students of 11 public universities in a seven state region through a consortial arrangement
- combines major efforts in distance-learning research, course development, and course delivery in the same organization
- conducts one of the most extensive distance-learning research efforts in the United States focusing on adult interest and participation in media-based learning
- has produced a wide range of video- and audio-based programming for distribution to UMA members and other educational institutions
- serves as a catalyst for the development, expansion, and refinement of distance-learning programs at its member universities; all but one UMA member institution plan to maintain their delivery systems after the NIE funds terminate
- includes an extensive formative evaluation component in its team approach to course development
- develops courses that have a heavy emphasis on print materials; video or audio components vary from 5 to 15 half hours per course
- sponsors major national and regional conferences on open-learning and non-traditional education
- has served almost 20,000 learners between 1974-1981
- evolving from a regional consortium into a national external degree program—the American Open University

### Problems Encountered

- overcoming the institutional parochialism of some member universities that assume the involvement of other organizations (in "our" program) will dilute quality or diminish the number of enrollments

- defining a mission for UMA once it was clear the member universities would not support the original concept of an external degree program that would enroll students directly
- establishing and maintaining an effective working relationship with the National Institute of Education during a nine-year period in which both UMA and NIE were undergoing numerous internal changes
- reducing expectations for UMA's performance in the face of lower funding levels than were anticipated at its founding
- managing an experimental program that is making innovations on many levels at once; organization, delivery system, curriculum, technology, and clientele
- being committed to producing video and audio materials that meet the high quality and cost standards of the broadcast industry; this constraint reduced internal financial and programmatic options to experiment with lower cost delivery technologies
- resolving tensions between the perception of UMA as a producer consortium (developing and distributing materials chosen by UMA central staff) and as a user consortium (developing and distributing materials to meet the expressed specific needs of its member institutions)
- designing and developing courses at UMA's headquarters without sufficient interaction with staff and students at the local institutional delivery system level
- resolving tensions between its role as a nationally funded experimental and demonstration organization and its role as producer of products to meet regional and locally defined needs
- being almost totally reliant on funding from one government agency

### Observations About Distance Learning

- designing and developing distance-learning courses without

Consequently, even though UMA courses were developed for distance learners, at a majority of UMA universities they also are used by faculty to supplement on-campus classes.

### Faculty Roles

Faculty from member institutions and other colleges and universities serve as content experts in the UMA course development process, both as course team members and as advisors to the teams. At each member institution faculty also are involved in decisions regarding whether or not to offer telecommunications-based courses produced by UMA, by other producers, or by their own institution. The nature of faculty involvement in course implementation varies among the UMA member institutions, but in most cases faculty maintain contact with their distance learners by telephone, mail, and face-to-face meetings as well as in required and optional class meetings.

### Delivery System

Like other consortia whose member institutions use telecommunications to offer courses, the UMA delivery system reflects the diversity of the 11 public institutions that actually serve the students. Some of these are land grant institutions that have a long and distinguished history of outreach to off-campus learners through extension, correspondence, and telecommunications, and others only recently have begun to develop the capacity to serve learners beyond the campus.

Students taking UMA courses view the video segments over public broadcasting stations, cable television channels, or on videotape in libraries or learning centers. Radio/audio segments are available over local FM stations or on audiotapes. These video and audio course components are distributed by UMA to member institutions via mail. Print components of UMA courses, which include study guides, textbooks, and other materials also are mailed to member institutions.

Student-faculty interaction takes place via mail, telephone, and group and individual face-to-face meetings. Research by UMA staff revealed that telephone hotlines (toll-free telephone access to faculty and staff) were particularly popular with students in small towns and rural areas. Many UMA institutions use learning centers and libraries to provide needed student support services. Each of the 7 UMA states has a coordinator whose responsibility it is to coordinate delivery of UMA courses.

### Enrollment

Since its founding, 1973, member institutions have enrolled over 20,000 in UMA courses. The average annual enrollment, currently about 3,000 students, has continued to rise: in 1978-79 it was 2,836, in 1979-80 it was 3,000, and in 1980-81 it was 3,300. Although the completion rate varies from one institution to another, the average range is approximately 75 to 90 percent.

### Administrative Structure

The board of trustees of UMA is comprised of the presidents of the member universities and six at-large members from the business, labor, and higher education communities. In addition, an Institutional Advisory Council with two faculty and administrative members from each member university advises the UMA staff and board on curriculum planning and course development matters. A National Panel of Advisors, which includes prominent individuals from government, education, industry, labor, and philanthropy, offers advice to the board of trustees from a national perspective.

The UMA central office, located in Lincoln, Nebraska, focuses on overall planning, course development, research, and dissemination, and the member universities are responsible for delivering instruction and support services to the students. The UMA office employs 60 staff members, most part-time.

### Finances

The major source of support for UMA has been the U.S. Department of Education's National Institute of Education NIE support has grown from approximately $900,000 in 1974 to $2.15 million in 1981. UMA's annual operating budget is approximately $4 million. Additional income has come from both public and private funding sources as well as from the sale of lease of video, audio, and print materials. Major expenses include salaries, course production, research marketing, and promotion. The UMA budget from NIE provides for $40,000 per state to support the activities of a delivery coordinator in each of the seven member states.

## Resources Available *

Research Publications List, *Catalog 81-82 Supplement, Final Report, Adult Learning Research Conference 1979, Future Directions for Open Learning, Plan for the American Open University,* various pamphlets on the American Open University, and flyers and pamphlets on instructional materials produced or distributed by UMA.

*Television Courses*:
Japan: The Living Tradition
Japan: The Changing Tradition
The Great Plains Experience
Anyone for Tennyson?
Mini-Series
Going Metric
Pests, Pesticides and Safety
Close to Home (Parenting)
Management: Listening for Understanding and Work Redesign
Introduction to World Food Problems
Jazz: An American Classic
Loosening the Grip (An Introduction to Alcohol Use and Abuse)
American Business History
Accounting I
Accounting II
Case Studies in Small Business
*Radio/Audio Courses*:
Foundation of American Nationalism

* Audio, video and print resources developed by UMA can still be obtained by writing to:
Great Plains National Instructional Library
P.O. Box 82006
Lincoln, Nebraska 68501

sufficient involvement by delivery system practitioners can result in a poor match between product and need

- the more motivated distance learner does not need or want elaborately produced television programming; high-cost video productions with an emphasis on entertainment work best with the least motivated learners
- most adult learners want television-based courses to stimulate them, but do not want to feel they are being entertained or having their time wasted
- using a limited amount of video material in distance-learning courses (in comparison with print) may be most appropriate for adult learners; UMA's early courses included 13 to 15 half hours of video per course, but gradually evolved to an average of about 6 half hours of video per course
- the development and delivery of distance-learning courses are greatly enhanced by input from a related research component capable of formative and summative evaluation
- business and social science courses attract the most enrollments, followed by humanities and education courses
- telephone hotlines are particularly popular with students in small towns and rural areas

## Future Plans

- continue plans to implement the American Open University
- publish results of a follow-up survey of State University of Nebraska (SUN) distance learners

## Contacts

For publications:
University of Mid-America
P.O. Box 82006
Lincoln, Nebraska 68501
For American Open University information:
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American Open University
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# UNIVERSITY OF MINNESOTA

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## Telecommunications Program

Courses by Radio and Television, Department of Independent Study and University Media Resources (UMR)

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### Educational Mission

As part of its regular instructional offerings, the Department of Independent Study designs, develops, and, with UMR, produces and distributes university-level credit instruction using a television or radio component in conjunction with a study guide and other printed materials. Courses are distributed statewide and nationally. Courses produced locally are supplemented by offerings produced by other institutions and by wraparound courses based on PBS series. Broadcast portions serve a broad audience, including certificate and degree students, both graduate and undergraduate, continuing education students, and the casual viewer/listener. Students range in age from 17 to 74, with the average age about 40. Sixty to seventy percent are women, and approximately 50 percent are enrolled concurrently in on-campus as well as radio and television courses.

### Telecommunications Technologies

Broadcast portions of Courses by Radio and Television are produced in the Minneapolis studios of the University of Minnesota by production personnel of University Media Resources in conjunction with the instructor and staff of the Department of Independent Study. Radio programs are broadcast over KUOM, the University radio station in Minneapolis, and other public broadcasting stations statewide. Television programs are broadcast over KTCA-TV, Twin Cities public television, other public stations statewide, and over several cable systems outside the Twin Cities. Audio and video cassettes of broadcast portions also are available for individual use at library and learning resource centers throughout Minnesota, permitting student access to a far more extensive curriculum than that broadcast each quarter.

### Curriculum

Course offerings are determined by the coordinator for media-assisted instruction, Department of Independent Study, in conjunction with university faculty and an advisory committee consisting of administrative staff members of the Department of Independent Study and administrative and production personnel from University Media Resources. Courses developed with a television or radio component are representative, insofar as is possible, of the full range of the university's curricular offerings, with a commitment to making the most effective use of telecommunications technologies.

An average of two radio and five television courses is offered per quarter. The university usually has produced 20 half-hours of television programming per quarter, supplementing this with courses leased from other institutions and wrap-around courses based on PBS series aired on public television. University faculty, in conjunction with instructional design and editorial staff in the Department of Independent Study, develop study guides for use with PBS series. All courses carry university credit and can be applied toward University of Minnesota degrees; no degree program is available solely through television instruction at this time. Academic integrity is ensured through lengthy and continuous consultation with faculty in planning and in developing print and broadcast components of courses.

Criteria considered in course selection include the following: relationship of the proposed course to the entire independent study curriculum; demonstrated audience need and appeal; long-term interest in the subject matter; course accreditation by the academic department; faculty member's reputation as scholar and teacher; use of the telecommunications format; and the capacity of the course to reaffirm the research, teaching, and public service stature of the University of Minnesota. Television courses produced recently by the university include "Jazz: An American Classic," "American Business History," and "Child Abuse and Neglect."

### Faculty Roles

The individual faculty member has full responsibility for developing course content. The faculty member first designs and writes the study guide, with the assistance of instructional design and editorial staff from the Department of Independent Study. Staff from University Media Resources then produce the broadcast portions, being careful to match the print and broadcast components. Faculty participation in independent study teaching is considered overload, so faculty members receive a course development fee. The instructor or a teaching assistant from the instructor's academic department is paid for grading on a per-lesson basis. If the course is rebroadcast, a percentage of revenues is paid to the instructor. Forty-five full-time University of Minnesota faculty and 18 adjunct faculty constitute the academic staff of the program.

## Delivery System

In Minneapolis-St. Paul, broadcast portions of radio courses are carried by the university's radio station, KUOM; broadcast portions of television courses are carried by KTCA-TV. Elsewhere in Minnesota, broadcast is over local public radio and television stations, with payment made by the Department of Independent Study for air time. Videotapes also are distributed directly to cable companies throughout the state.

Audio and video cassettes are available to students for individual use at several public libraries and at learning resource centers at University of Minnesota campuses throughout the state. Student lessons, exams, and papers are submitted by mail for faculty evaluation through the Department of Independent Study. Instructors schedule telephone office hours to handle student questions, and some courses include optional class meetings for student questions and review.

## Enrollment

Enrollment in courses by television dropped sharply in 1977-78, following a change in broadcast schedule from prime time to early morning. Enrollment subsequently has stabilized and is growing steadily. In 1979-80, 631 students enrolled in television courses and 69 students in radio courses, for a yearly total of 700. In 1980-81, 847 students enrolled in television courses and 81 in radio courses, for a yearly total of 928 students. This yearly figure is determined on the basis of the total number of students paying tuition by the end of each term, excluding cancellations. The completion rate is approximately 75 percent. New approaches to curriculum planning and promotion are expected to produce an increase in enrollment by 1983-84.

## Administrative Structure

The administrative structure responsible for the development and production of Courses by Radio and Television has been evolving since 1955 when the University of Minnesota produced its first television course. The coordinator for media-assisted instruction, an academic staff member of the Department of Independent Study, is responsible for the design and development of all television and radio courses. With other administrative personnel from that department, she determines the role of media-assisted courses in the independent study curriculum. Courses are selected with assistance from the Television Independent Study Committee, an advisory body comprised of instructional design personnel from the Department of Independent Study, production staff from University Media Resources, and representatives of the faculty; it is chaired by the coordinator of media-assisted instruction.

The Department of Independent Study, as the key administrative unit for the program, handles course design and development; faculty contracts; editorial and promotional work; and student registration, testing, and problems. The director of independent study also is responsible for the correspondence program and reports to the associate dean for instructional systems, continuing education and extension. The coordinator for media-assisted instruction is assisted by one full-time and one part-time staff member, with in-kind assistance from 20 members of the Department of Independent Study.

## Finances

Production costs for broadcast portions of television and radio courses are carried by University Media Resources and paid from the university's general operating budget. Otherwise, the program is self-supporting and relies on student tuition and occasional

### Noteworthy Features

- has produced courses with a broadcast component since 1955
- has a 20-year-old administrative structure for independent study
- benefits from the cooperation of two key university support structures—the instructional design, editorial, promotional, and administrative staff of the Department of Independent Study, and the media production staff of University Media Resources
- offers curricular programming that reflects the scholarly and instructional strengths of University of Minnesota faculty
- utilizes both university faculty members and instructional design staff in the course development process
- designs and develops course and study guides before producing the broadcast component
- benefits from the availability of a professional studio for media production

### Problems Encountered

- having to rely upon the limited resources of student tuition for financial support
- managing the program in spite of little institutional reward for faculty participation, involvement in most cases is overload teaching with minimal remuneration
- overcoming the distrust among some faculty of the academic integrity of telecommunications courses in general

### Observations About Distance Learning

- managing distance learning is an expensive undertaking, requiring considerable leadtime and careful planning
- distance learners appear more motivated to study than their on-campus counterparts
- faculty often find the diversity of off-campus students is "invigorating"

### Future Plans

- explore use of interactive media requiring hardware changes

- explore further use of cable as a more extensive delivery vehicle
- achieve more careful coordination of the entire independent study curriculum as a result of administrative reorganization
- undertake more extensive promotion and marketing following administrative reorganization

## Contact person

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grant support. Major direct costs include remuneration to faculty for course development, purchase of air time, promotion, and mailing expenses. Contributed costs include overall program administration and editorial and secretarial time. Direct costs and administrative costs total approximately $144,000, and production costs total approximately $210,000 per year.

## Resources Available

Bulletin, promotional flyers, and posters describing course offerings each term, and a study guide and cassette for a particular course being considered for possible adoption are available upon request.

*Courses*

24 video and 26 audio courses are available for lease.

# UNIVERSITY OF NEBRASKA, LINCOLN

## Telecommunications Program

Department of Mediated Instruction (DMI) of the Division of Continuing Studies (DCS)

## Educational Mission

The Division of Continuing Studies (DCS) is the public-service arm of the University of Nebraska and has, since 1909, extended the university's resources to part-time students not in residence. In addition to DCS services such as evening courses, independent study, conferences, seminars, and short courses, the division's Department of Mediated Instruction (DMI) offers television courses for distance learners. DMI offers credit and noncredit television-based courses to undergraduates and employed professionals. Most of DMI's activity is focused on providing telecourses to adults in their thirties (half male, half female) who are seeking a nonthreatening way to ease into or return to learning at the college level. Telecourse students live all over the state of Nebraska. Approximately 10 percent are enrolled concurrently at UN campuses. DMI has recently begun videotaping graduate engineering courses for distribution to professional engineers in Nebraska. This is currently a very modest, but, nevertheless, expanding effort. In addition to handling telecourses, DMI operates the Instructional Media Center for UNL and coordinates the use of media within the Division of Continuing Studies.

## Telecommunications Technologies

The Department of Mediated Instruction uses public broadcast television, cable, and video and audiotapes to distribute its television-based courses. A toll-free telephone line facilitates communication between faculty and students. Recently, an audio teleconferencing network has been implemented to serve eight Nebraska cities.

## Curriculum

Introductory undergraduate courses include social science, humanities, and general-interest subjects. Of the five broadcast courses offered each semester, almost all are leased from national distributors such as Coastline Community College, the Dallas County Community College District, and the University of Mid-America. Courses are jointly purchased through the Central Educational Network Postsecondary Council and through Public Broadcasting's Adult Learning Programming Service (PTV-3). DMI has produced its own course called "Real Estate Principles and Practices," which was originally offered as a correspondence course before the television component was added. The graduate engineering courses are selected in cooperation with the UNL College of Engineering and local employers.

The telecourses are a natural outgrowth of the Division of Continuing Studies' long-term commitment to independent correspondence study. The division has the academic and logistical capability to serve over 3,500 students working toward high school degrees and over 2,000 working toward college degrees from all over the country and in 120 countries worldwide. Although there is some overlap between independent study and the telecourses (less than 10 percent of television students also take independent study courses), the primary benefit of the telecourse students and administrators is the existing logistical structure (registration, distribution of materials by mail, WATTS lines, etc.) and the faculty acceptance of distance learning that is associated with independent study by correspondence.

## Faculty Roles

The faculty assigned to the telecourses are recommended by the chairman of the department with responsibility for the course. They may be regular or adjunct faculty. DCS staff provide faculty with orientation materials and logistical assistance in handling mail communication with students. Faculty make most of their contact with students via telephone and mail.

## Delivery System

Undergraduate telecourses are broadcast over the Nebraska ETV network, thereby making it possible for DMI to serve localities all over the state. Since face-to-face meetings are, for all practical purposes, precluded in this statewide delivery system,

### Noteworthy Features

- manages a statewide delivery system in a state with virtually no other telecommunications learning options available to distance learners
- integrates its telecourse delivery system into an existing logistical capacity (registration, cashier, book distribution, testing) developed to support a large independent study program
- serves a very high proportion of off-campus adults; 90 percent of DMI's students are not enrolled in on-campus classes
- uses cable television to distribute certain courses as well as to repeat courses previously delivered by broadcast

### Problems Encountered

- advertising telecourse availability on a statewide basis when no single newspaper covers the entire state
- determining, in advance, which courses to offer
- dealing with the consequences of having to televise a course regardless of the number of enrollments it attracts once it has been leased and advertised
- orienting faculty to the use of television for distance learning
- obtaining and maintaining, from various publishers, adequate supplies of books needed to support telecourse students
- obtaining adequate time on statewide PBS system to broadcast courses

### Observations About Distance Learning

- acceptance of telecourses by faculty has been easier because of the regional presence of the University of Mid-America and UNL's participation in it
- academic acceptance of telecommunications as a vehicle for distance learning has been eased by the existing UNL commitment to independent correspondence study
- it is important to offer at least some television courses each se-

mester without interruption because a lapse of programming for even one semester will greatly diminish student participation
- enrollment in a specific course will drop if it is offered consecutively for two or more semesters
- student completion rates are greatly enhanced by having faculty initiate written and/or phone contact early and often in the semester
- the early morning, late evening, and weekend hours that usually are the only ones television stations will make available to educators are also convenient times for most adult learners

### Future Plans

- make use of cable distribution to gain more opportunity for initial and repeat broadcasts and to reduce costs
- develop an adult service offering three to four hours of programming per week
- offer noncredit continuing education via audio and video teleconferencing
- explore possible combinations of the use of home computers and independent study

### Contact Person

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faculty rely heavily on mail and telephone to support their students. In addition to a toll-free phone students can use to communicate with faculty during scheduled office hours, the faculty can use a WATTS line to initiate calls to students. Faculty are encouraged to send an introductory letter to students at the beginning of the course as well as other letters and memos later on. The DMI staff sends at least one newsletter to all students each semester. Assignments and quizzes, along with a midterm and a final exam, are used to help pace the students and serve as a feedback mechanism for faculty and students. Quizzes are handled by mail, but examinations are administered in the local communities at the county public libraries, with the librarians serving as proctors. Audiotapes of the audio portion of some televised lessons are also available to students at UNL and through the mail.

Faculty teaching the graduate engineering courses to professionals in Nebraska supplement the videotaped classes with several site visits to the off-campus worksites where the students are employed. Students also have access to the faculty via telephone.

### Enrollment

The five undergraduate courses generally enroll between 200 to 300 students per year, based upon registrations as of the fourth week of the semester. The engineering courses attract 25 to 30 students each semester. The completion rate in the undergraduate telecourses is 60 to 75 percent, and it is almost 100 percent in the graduate courses.

### Administrative Structure

The Department of Mediated Instruction is located in the division of Continuing Studies of the University of Nebraska at Lincoln. DMI has one part-time and 15 full-time employees.

### Finances

The portion of DMI's budget that deals with telecourses totals approximately $55,000 a year. Major expenses include leasing telecourses, advertising and promotion, and staff and faculty salaries. Faculty are paid on an overload basis, depending on the number of students registered in their class. Income sources include student fees and grants from the University of Mid-America, of which UNL is a participating member.

### Resources Available

Telecourse Faculty Guidelines, telecourse brochures, description of logistical policies and procedures, flow chart of procedures for administering telecourses from acquisition to broadcast.

*Course*
Real Estate Principles and Practices

# UNIVERSITY OF NEVADA, RENO

## Telecommunications Program

University of Nevada Interactive Teleconferencing for Education (UNITE)

## Educational Mission

UNITE began in January 1980 as an alternative method for delivering instruction to residents in less populated areas of the state who otherwise could not participate in upper-division and graduate-level courses or programs. In addition, UNITE has provided public services to state professional associations and other agencies and has supported several administrative functions of the university. Students served by the instructional program tend to be older than on-campus students, and most work full-time in a technical or professional field. Few students served are enrolled concurrently at the University of Nevada, Reno campus.

## Telecommunications Technologies

UNITE is a statewide, two-way, interactive, audio teleconferencing system that makes extensive use of audio-visual equipment (e.g., slides and overhead projectors) to supplement the audio communication at its off-campus sites.

## Curriculum

Of the thirteen courses offered by UNITE in 1980-81, four could be taken for either graduate or undergraduate credit in the liberal arts, education, and home economics (a course on child abuse) fields; three were noncredit, personal enrichment courses (solar energy, state history); and six were professional continuing education courses designed for real estate and insurance employees. Continuing education staff, along with staff of the Office of Communications and Broadcasting, meet periodically to identify courses that are compatible with teleconferencing technology and for which there seems to be a sufficient student market. Then, a faculty member whose teaching style and personality seems well suited to an audio instructional mode is recruited to present the course. Considerable effort is spent by faculty in developing an elaborate, fully printed syllabus for the course. This syllabus is distributed in advance to students. Faculty also are extensively involved in developing overhead material and other supplementary material for use during course sessions.

## Faculty Roles

When UNITE was still in its formative stage, the Graduate Council was, reportedly, skeptical about the ability of the university to offer quality graduate education to individuals living in remote areas of the state who lacked access to the facilities of a graduate-calibre library. Two highly respected members of this council were two of the first faculty members to teach on the UNITE system. Their early successful experiences helped persuade their colleagues of the merits of the new system. Only faculty who are members of the university or individuals whose credentials are specially approved by the Graduate Council may teach UNITE courses offered for graduate credit. Faculty selected to teach UNITE courses are provided with instructional design assistance from staff of the Office of Communications and Broadcasting. Financial incentives were offered to faculty when the system first began, but that is no longer current practice. Some faculty members travel periodically to off-campus learning sites, and some have utilized part of their class time to provide special conference assistance to individual students. No standard practices, however, are followed by all faculty. Students in graduate degree programs must periodically travel to the campus to meet with their advisors. Scheduled telephone advising hours also are available.

## Delivery System

UNITE links 17 off-campus sites with each other and with the university's special teleconferencing classroom. It serves an 82,000-square-mile area of the state. Most sites are in local high schools, and a few are in public libraries. In the past, hospitals also have served as sites. Broadcasts can be initiated from any one of the sites. In addition, a faculty member located outside the state can be connected to the system to provide instruction. A coordinator located at each local site receives and distributes printed course materials, registers students, moni-

## Noteworthy Features

- offers graduate and undergraduate courses on a statewide audio conferencing network
- serves an extensive geographic area containing many rural communities
- achieves high reliability from its technical equipment
- is operated by one university rather than by a consortium
- makes extensive use of various visual media to supplement the audio teleconferencing system
- places heavy emphasis on providing students with extensive print material to supplement audio teleconferencing
- overcame much of the initial faculty resistance to using audio teleconferencing by having prominent members of the faculty Graduate Council teach some of the first courses

## Problems Encountered

- overcoming faculty resistance to change; it is still difficult to recruit faculty to teach in the system
- covering the costs of running the audio teleconferencing systems
- distributing the extensive print and visual materials to off-campus students in a timely manner

## Observations About Distance Learning

- the quality of instruction varies, just as it does with nonteleconferenced courses
- the technology does not seem to interfere with the teaching or the learning process
- faculty/student interaction is characterized by a high degree of esprit de corps and personableness
- students are very willing to speak up and ask questions in the classes, perhaps because they experience small class settings (as opposed to one large lecture class) and do not have to raise their hands or respond to instructor cues to be recognized or called upon

### Future Plans

- expand the number of courses offered and increase the noninstructional uses of the system (meetings, conferences)
- increase the number of off-campus sites; the number of sites can be doubled at only a modest additional cost
- explore the use of a visual component to the system
- explore and test a computer hookup, using the same dedicated telephone lines; there is a special interest in increasing access to library materials via a computer as well as in using the computer for instructional purposes
- use the system to assist administrators with alumni programs and with student recruitment
- add VHS video cassette players to 10 sites within the system

### Contact Person

Neal Ferguson
UNITE Program
Dean, Continuing Education
College Inn, Room 335
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tors attendance, and operates the equipment. All sites are equipped with slide projectors, audiotape players, and overhead projectors. Most courses are offered during evening hours; occasionally they are offered on Saturdays and during the late afternoon. Noninstructional uses of the system have included statewide library association meetings, legislative hearings involving the taking of testimony, and the screening and interviewing of candidates for university employment. Also, high school students participated in a science program taught by an instructor who was located in southern California.

### Enrollment

During 1980-81, 571 students completed one or more of the 13 courses offered by UNITE: 9 percent enrolled in the noncredit, personal enrichment courses; 18 percent in the courses offered for graduate/undergraduate credit; and 73 percent enrolled in the real estate and insurance classes. Retention is reportedly very high, particularly in professional continuing education courses. Although no figures are available for the year, in spring 1980 the on-campus retention rate was 80 percent compared with a 90 percent rate for UNITE.

### Administrative Structure

UNITE is operated by staff in the Office of Communications and Broadcasting, which is located in the Office of the Vice President for Academic Affairs. The office is staffed by a full-time coordinator of technology and four engineers, all of whom assist with the teleconferencing operation as well as perform other duties. The dean of continuing education is responsible for administering UNITE courses. This office also is located in the academic affairs office, an arrangement that facilitates close communication and collaboration with the Office of Communications and Broadcasting.

### Finances

Support for UNITE is provided by student course registration fees (set at the same rate as for on-campus courses) and by direct service charges to agencies using the system for noninstructional purposes. The equipment currently being used was purchased with Title I funds ($70,000). System technical operating costs are about $24,000 per year. Off-campus site coordinators are paid a flat fee each year by the Office of Continuing Education and an additional fee for every successful course offered (courses in which local students enrolled). Staff are supported with general continuing education funds. A separate budget for UNITE is not maintained. Revenue from noncredit courses is profit-shared with university departments. There are no significant contributed costs that support UNITE operations. Major expenses include telephone service and staff salaries.

### Resources Available

Descriptive brochures; several special articles prepared about the experience with real estate courses. Those interested are encouraged to call the program office for further information.

# UNIVERSITY OF SOUTH CAROLINA (USC) AND THE SOUTH CAROLINA EDUCATIONAL TELEVISION NETWORK (S.C. ETV)

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## Telecommunications Program

Continuing Education

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### Educational Mission

Since the University of South Carolina and the South Carolina Educational Television Network work so closely together in using television to meet the educational needs of the state's citizens, and since there are numerous organizational units within USC involved in this educational mission, the term Continuing Education will be used here to refer to all these activities in the aggregate. Educational programming is offered in cooperation with S.C. ETV by the following USC programs:

- Telecommunications Instruction (offering undergraduate and graduate credit courses from various disciplines by television and radio)
- College of Business Administration (offering a master's degree by television)
- College of Engineering (offering a master's degree by television and video cassette)

Although Continuing Education involves some undergraduate programming (20 percent), approximately 80 percent of the educational programming conducted cooperatively by USC and S.C. ETV is graduate and professional continuing education. Public school teachers constitute a large block of Continuing Education clientele (40 percent), in part because they are required by the state to acquire six graduate credit hours every five years in order to renew their teaching certificates. Other professions served include engineering, business, pharmacy, and social work. The undergraduate courses serve students concurrently enrolled at other two and four year colleges in South Carolina as well as a broad range of working adults who are part-time learners seeking college credit or personal enrichment.

Results of a survey of Telecommunications Instruction students in the spring of 1980 show a majority of them are white (84 percent) and female (83 percent) and that they range in age from 17 to 70. Forty-eight percent of the students responding were between the ages of 26 and 35, and 28 percent were between the ages of 36 and 45. Most had already attained bachelor's degrees and over 60 percent already had credits beyond the B.A. degree.

### Telecommunications Technologies

Continuing Education students are served by the vast technological resources of the South Carolina Educational Television Network, which include open- broadcast television, closed-circuit television, FM radio, videotapes, and audiotapes. Local cable channels as well as regular telephone service and the audio talkback capacity of the closed-circuit television system are used to serve Continuing Education students.

In addition to its regular open-broadcast service, S.C. ETV operates a statewide, interactive, closed-circuit television network that utilizes telephone company microwave and coaxial cable facilities to transmit programs from the ETV Center in Columbia to over 400 schools, hospitals, police departments, technical colleges, and two- and four-year campuses of the USC system. For the purposes of Continuing Education, most programming is distributed to the nine USC campuses and ten technical colleges and higher education centers capable of providing one-way video and two-way audio, because these are equipped with an audio talkback capacity. Students at any of the sites can see the instructor and, by using push-to-talk microphones, they can be heard by anyone at any of the 19 sites in the system. The multi-channel capacity of the closed-circuit system makes it possible simultaneously to transmit more than one signal over the network and thereby serve numerous learner groups at the same time.

The Instructional Services Center (ISC) at USC has the capacity to feed programming to S.C. ETV and to Columbia Cable for distribution over the respective networks. Classes also can be transmitted live over the closed- circuit system from ISC.

### Curriculum

Courses offered by continuing education include lower- and upper-division undergraduate social science, science, humanities, and education; undergraduate and graduate engineering; and graduate education, busi-

### Noteworthy Features

- combines the resources of the state's major university and the statewide educational television network to serve adult learners all over South Carolina
- focuses most of its educational programming (80 percent) on graduate and professional continuing education
- offers educational programming over an open-broadcast and a closed-circuit television network as well as an educational radio network and a cable television network
- serves students over an interactive (two-way audio, one-way video) closed-circuit television network connecting 19 postsecondary educational institutions and numerous other public buildings (police stations, hospitals, public schools) throughout the state
- offers a complete M.B.A. program over a statewide closed-circuit television network
- offers a complete master's degree in engineering through closed-circuit television and video cassette delivery
- supplements videotaped undergraduate engineering courses with weekly statewide video teleconferences in order to provide live student/faculty interaction along with the convenience of videotaped presentations
- offers some television courses for both undergraduate and graduate credit; student assignments vary depending on the level of credit
- combines responsibility for off-campus instruction by telecommunications and by correspondence in the same program—Telecommunications Instruction and Correspondence Study

### Problems Encountered

- working within the limited amount of air time available on the open-broadcast television network
- working within the limitations on the number of staff available to

assist in the design and management of pre-recorded television courses
- continuing to develop courses in spite of the high costs of producing new television courses
- adjusting to the need for Telecommunications Instruction to devise more adequate student support services; PTV-3 courses are attracting a broader cross section of learners than the highly motivated students who traditionally have been served
- providing adequate library resources for graduate students living in rural areas

### Observations About Distance Learning

- adult learners place great importance on the convenience and flexibility of the delivery system and continue to demand more of both
- adult learners are much more highly motivated than traditional-age students
- the strong commitment of at least one faculty member is essential in convincing an academic department to participate in the production and delivery of a television course
- distance learners value highly the opportunity to interact with faculty through the convenience of the closed-circuit television system
- PTV-3 courses are attracting a broader range of learners than has been the case in the past

### Future Plans

- explore the possibilities of establishing a statewide ITFS system
- expand the opportunities for independent learning by combining aspects of telecommunications and correspondence delivery
- reduce dependence on open-broadcast television as a delivery mode
- explore the possibility of leasing to other colleges and universities courses produced by USC and S.C. ETV

ness, pharmacy, social work, and librarianship.

Half the sixteen courses offered by Telecommunications Instruction in the fall of 1981 could have been taken either for undergraduate or graduate credit depending on arrangements made between the student and faculty member. Five were undergraduate only and three were graduate only. Fifteen were video and one was a radio/audio course. A few of these courses are leased through PBS's Adult Learning Programming Service (PTV-3), but the majority are produced jointly by S.C. ETV and USC.

The colleges of Engineering and Business Administration have been offering interactive courses over the S.C. ETV closed-circuit system since 1969. The College of Engineering offers two programs. One, called APOGEE (A Program of Graduate Engineering Education), offers live, interactive graduate courses over the closed-circuit system as well as videotaped courses. In the fall of 1981, APOGEE offered ten live and three videotaped courses to students all over South Carolina. In cooperation with Telecommunications Instruction, the College of Engineering also offers six videotape undergraduate courses each semester at seven two- and four-year USC campuses in the state. Videotapes are available at learning centers on participating campuses. The program is called Videocassette Undergraduate Engineering Education (VUEE) and is intended to provide basic engineering curriculum to concurrently enrolled students who may choose eventually to transfer from their current campus to USC-Columbia to pursue a B.S. in engineering. The College of Business Administration offered 10 courses in the fall of 1981.

## Faculty Roles

Those prerecorded television and radio/audio courses offered by Telecommunications Instructions that are locally produced involve USC faculty as content experts in the design, development, and taping stages, as well as in writing student study guides and other print material. Faculty also are involved in the selection and approval of prerecorded courses leased from national distributors.

Faculty with responsibility for teaching Telecommunications Instruction courses that include prerecorded video or audio segments interact with their widely dispersed students in a variety of ways. These include letters, telephone office hours (via a toll-free telephone number), the audio talkback capacity of the closed-circuit system, and, in some cases, faculty site visits to learning centers.

Faculty who teach live, interactive courses (e.g., M.B.A. and APOGEE courses) on the closed-circuit system are able to answer student questions during the class sessions. These faculty have complete responsiblity for the structure, content, and presentation of the courses they teach. Unlike faculty teaching the prerecorded courses offered by Telecommunications Instruction, these faculty do not usually produce a student study guide.

## Delivery System

The S.C. ETV open-broadcast and closed-circuit networks, S.C. Educational Radio Network, and Columbia Cable are the basic components of the continuing education delivery system. Since Telecommunications Instruction is the only program offering courses over the open-broadcast network, its staff puts special emphasis on encouraging faculty/student interaction because, unlike students taking courses taught on the closed-circuit system, students of Telecommunications Instruction cannot ask questions during the video segments. Most faculty initiate contact with their students by mail and are available for telephone consultation. A toll-free telephone number plus a 24-hour telephone answering service help facilitate such telephone interaction. Students registered for these courses receive an orientation pack including, in most cases, a syllabus, study guide, and text(s). Some courses require students to come to the Columbia campus for one or more seminars during the semester. Students in most courses are required to come to a nearby USC campus to take exams.

Courses taught on the closed-circuit network involve fewer auxiliary support services because students and faculty can interact during the class sessions. Closed-circuit classes are taught by USC faculty and originate in a classroom/studio equipped with a remote- control overhead camera that focuses on the instructor's writing pad and another camera that focuses on the instructor. Students in the studio/classroom at USC-Columbia and at all participating sites on the closed-circuit system can see the instructor and interact with him or her.

Students taking the Videocassette Undergraduate Engineering Education courses do most of their learning while viewing videotapes and reading textbooks. However, once a week these students come to one of the USC campuses to participate in a video teleconference, during which they are able to discuss the week's class material with the instructor and other students.

## Enrollment

The overall enrollment for Continuing Education in 1980-81 was approximately 3,300.

| | |
|---|---|
| Telecommunications Instruction | 2,350 |
| College of Engineering | 360 |
| School of Business Administration | 563 |

The average completion rate for these courses is better than 95 percent. Enrollment figures are reported as of the final week of the semester.

## Administrative Structure

The USC programs involved in the delivery of courses via telecommunications are listed under the heading "Educational Mission" in this description. Each of these programs works in cooperation with the Instructional Services Center, which transmits programming to S.C. ETV for distribution throughout the state. The director of the Division of Continuing Education at S.C. ETV works very closely with Telecommunications Instruction, in the production and delivery of video courses.

At USC, major decisions about telecommunications programming are made by the Telecommunications Review committee, whose core members include the associate provost, vice president and associate vice president for two-year campuses and continuing education, senior vice president for administration, chairman of the graduate council television subcommittee, and at least one faculty member.

S.C. ETV's Division of Continuing Education provides support services in the form of staff time and production facilities. Course production costs normally are covered by grants. In addition, the division provides USC and other colleges and universities with access to both its open-circuit and closed-circuit broadcasting facilities at no charge. The division's mission also includes adult continuing education in other fields, such as medicine, business and industry.

Telecommunications Instruction employs five full-time employees and relies heavily on student-assistant help. The faculty who teach their courses or who assist in course development are paid on an overload basis by Telecommunications Instruction, or they participate as part of their regular load in their academic department/college. The colleges of Business Administration and Engineering each employ one-and-a-half full-time equivalents and their respective faculties teach in the programs as part of their regular teaching load. A designated staff member at each of the USC campuses and technical colleges on the closed-circuit system is paid a stipend to function as the telecommunications coordinator and serves as a link between the students and the various programs on the USC-Columbia campus.

## Finances

The overall annual budget of Telecommunications Instruction is approximately $250,000 (excluding correspondence courses). Funds for producing course materials are handled on a special project basis when needed. The program of the colleges of Engineering and Business Administration are so thoroughly integrated into normal operations that only the salaries of their respective directors are treated as distinct budget items. The USC Instructional Service Center budget, which is approximately $1,000,000 per year, includes services to many USC programs besides Continuing Education. S.C. ETV's Division of Continuing Education contributes staff, production, and broadcast time as part of its overall mission, so specific figures for USC courses are not readily obtainable.

## Resources Available

Program description packet, course listing, S.C. ETV annual report.

## Contact Persons

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# UNIVERSITY OF SOUTH FLORIDA

### Noteworthy Features

- gives central role to academic departments in selecting, producing, and offering Open University courses
- relies heavily upon print, with television and radio used relatively sparingly
- uses take-home kits for some courses
- produces most courses rather than leasing them from others
- focuses on upper-division curriculum
- sets no limits on the number of students who can register for Open University courses
- has offered courses from six of the nine colleges in the university

### Problems Encountered

- accepting the reality that OU funding is based on a line item in the institution budget rather than directly reflecting FTE generated by the program
- attempting to get all departments to participate in the OU
- managing OU without sufficient funds for production and acquisition of course materials
- working within the constraints of a state prohibition against advertising courses beyond the campus which limits the numer of community adults who are aware of the availability of OU courses

### Observations About Distance Learning

- Convenience is the primary reason for the attractiveness of OU courses in this large, sprawling urban community
- courses need to be designed in various formats rather than in a single rigid format in order to respond to student needs and faculty preferences

### Future Plans

- explore the use of computers to increase the ability of the OU to individualize advice and feedback given to students
- achieve more distribution capability through cable and ITFS

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## Telecommunications Program

Open University (OU)

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### Educational Mission

Since its beginning in January 1972, the Open University of the University of South Florida has offered both upper- and lower-division distance learning courses for residents of the Tampa Bay region. Since USF is primarily a commuter institution, the radio- and television-based courses of the Open University offer convenient scheduling options for students already enrolled in on-campus classes. Approximately 75 to 80 percent of the Open University students concurrently are enrolled on campus. The average age of OU students is 18 to 32 years, and enrollment is divided about equally between men and women. The demographic traits of OU students closely reflect those of the general population of the Tampa Bay region. The University of South Florida also offers a weekend college program in conjunction with the To Educate the People Consortium. The activities of this consortium are detailed in a separate program description in this book.

### Telecommunications Technologies

The Open University uses public broadcast television and radio as well as audio and video cassettes to serve its students. The telephone is also used for student/faculty interaction. In addition, some courses are being offered over a suburban cable system that is still in the early stages of growth. Both WUSF-TV and WUSF-FM are licensed to the University of South Florida.

### Curriculum

Most of the Open University's courses are at the upper-division level; some of these also can be taken as graduate courses. Although OU does offer some lower-division courses, the emphasis is on upper-division, in part because USF has many transfer students and therefore tries not to compete with local community colleges that offer distance learning courses. The upper-division emphasis also is a reflection of the types of courses faculty prefer to offer. Most OU courses also are included. In fact, OU has offered courses from six of the nine USF colleges, covering a wide range of topics. Courses such as meteorology are accompanied by home experiment kits.

Of the 18 available OU courses, 11 are normally in use during any given term. Most Open University courses are produced by USF faculty and staff. In a recent term, eight were USF courses and three were local "wrap-around" courses, based on nationally broadcast programs like the PBS Shakespeare series. OU courses are heavily print-oriented, with radio or television constituting one-half hour to, in one case, four hours per week of the instructional experience.

### Faculty Roles

USF faculty are centrally involved in selecting, developing, and teaching courses offered by the Open University. All OU courses are listed in the course schedule with departmental prefixes so that there is no distinction between them and regular on-campus courses. For those courses produced by USF, faculty from the relevant department design the course, write the narrative, write the student study guide, work with instructional designers on the OU staff, and participate in the actual taping of the video or audio segments. When the OU adds its own "wrap-around" segments to a video or audio series produced elsewhere, the faculty also write that material and then participate in taping the additional openings, closings, or replacement segments. Since so many OU students are taking one or more courses on campus, there are opportunities for personal as well as telephone contacts between faculty and students once the course is underway. In addition, faculty usually hold two or more optional on-campus meetings with their students. The OU staff have an informal approach to orienting departmental faculty to the processes of developing and teaching distance learning courses that use radio or television.

### Delivery System

Each radio or television segment of the course is initially broadcast and then repeated at another time during the week.

Students can also review tapes in the university's media center at their own convenience. Some courses (e.g., the Shakespeare plays) include both radio and television segments. Since the radio or television component of the courses is often only 30 minutes long each week, much of the course content is conveyed via print materials, which normally include a study guide, one or more textbooks, and a list of required and recommended readings. Faculty are available for individual consultation with students by telephone and in person. OU students normally attend at least two on-campus class meetings to review for, and take, the course examination.

## Enrollment

In 1980-81 the Open University enrolled approximately 1,000 students per term, for a total of over 4,000 for the year. The OU's 80-percent course completion rate is, in part, due to the fact that so many of its students are pursuing degrees and already taking one or more courses on campus. (Enrollment figures based on participation through the end of the term.)

## Administrative Structure

The Open University staff report to the director of instructional services, who is in charge of the Division of Educational Resources. These activities fall within the purview of the vice president for academic affairs. The Open University benefits from its organizational proximity to the broadcast stations, the university's media center, and the audio-visual and production facilities of the Division of Educational Resources. There are three full-time and three student assistants on the Open University staff.

## Finances

In 1979-80, when the staff consisted of one and one-half full-time persons, the overall budget of the Open University was $72,247. Approximately $36,000 of this was expended for regular staff salaries, $25,000 for production (tapes, graphics sets, etc.), and $10,000 for additional personnel services from faculty and student employees. These figures do not reflect contributed services of the television and radio station (staff, space, air time). OU accounts for 30 to 40 percent of the air time of the stations, which have a total budget of $1.4 million. The Open University is supported by the USF institutional budget. The OU's budget level is indirectly affected by its contributions to the FTE generated by the academic departments.

## Resources Available

Course schedule, study guides.

**Courses:**

Gerontology: New Perspectives on Middle Age
Gerontology: New Perspectives on Pre-Retirement
Weather and Man: Anthropological Perspective (Introductory Level)
Issues in Music: Introduction to Classical Music
Introduction to Art

- increase cooperative arrangements with community colleges in the region
- improve the registration and advising processes to make them more convenient for students

## Contact Person

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# THE UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER AT SAN ANTONIO

### Noteworthy Features

- provides live, interactive health-related continuing education and credit courses for employees of 90 hospitals in Texas
- operates an audio teleconferencing system that covers a large geographical area with over 3,550 miles of telephone circuitry
- offers on the network a "Good Health" series for community adults over 55 years of age
- brings the benefits of current medical experts to small town and rural hospitals that have few alternative sources of interactive training
- orients faculty and other experts to the mechanical and pedagogical peculiarities of teaching on an audio teleconferencing system
- uses slides and videotapes to supplement the interactive audio instruction
- provides learners with extensive study guides that include narrative material and print versions of essential video materials used during the program
- works cooperatively with other state agency audio teleconferencing networks to expand audiences for programs
- works with the U.S. Army to convert a TNT emergency nursing course and study guide for use as a video training course
- links with agencies outside the state via conference calls to expand educational resources and services

### Problems Encountered

- eliciting questions and comments from network participants
- conveying to faculty and speakers how to make presentations in a manner that elicits questions and comments from network participants
- scheduling programming during the work day at times that are convenient for a wide range of professionals
- overcoming technical problems in the telephone lines, teleconferencing equipment, and videotape and slide equipment

## Telecommunications Program

Teleconference Network of Texas (TNT)

## Educational Mission

The Teleconference Network of Texas has been offering live, interactive continuing medical education since 1971 to medical personnel employed in hospitals throughout Texas. Since the fall of 1981, TNT also has offered credit courses through the University of Texas at Austin. Currently the network serves 90 public (both civilian and military) and private hospitals in large urban areas, small rural communities, and everywhere in between. Because many of the larger urban areas have their own university medical centers and because TNT's mission has always been to serve the more remote rural communities, there is a larger proportion of participating hospitals from smaller, rural areas. Some communities are so small they have only one or two physicians.

TNT provides continuing educational programming over its audio teleconferencing network to personnel employed in hospitals, including, but not limited to: physicians, nurses, laboratory technicians, dentists, dental auxiliary staff, emergency medical technicians, pharmacists, radiological technicians, physical therapists, respiratory therapists, and hospital administrators. In addition, TNT offers programming for lay people over 55 years of age who live in the community and have an interest in learning about health issues related to aging.

## Telecommunications Technologies

TNT uses a dedicated, four-wire, telephone circuit that makes possible live interactive audio teleconferencing among all 90 hospitals in the network. Each hospital is equipped with at least one Darome Convener and a push-to-talk microphone. Teleconference bridging equipment in Austin, Texas, which is available for TNT use, makes it possible to link individual callers (e.g., resource persons) or other audio teleconferencing systems (e.g., Georgia Hospital Association) into the TNT.

Until recently, video material to supplement the audio programming has been limited to 35 mm slides. For certain programs the network staff distribute videotapes produced in cooperation with the instructor or acquired from other organizations that can be viewed either before or during the scheduled audio teleconference. Distribution of video material via cable and satellite is being explored at this time.

## Curriculum

TNT offers both continuing education for health care professionals and bachelor's degree credit courses. So far most of the credit courses have been appropriate for licensed practical nurses pursuing a bachelor's degree in nursing. These credit courses are taught by faculty from The University of Texas at Austin. Of the 18 scheduled hours of TNT programming each week, approximately 3 are devoted to credit instruction.

There are no state requirements for continuing medical education in Texas. Participants in the network are motivated by a desire to maintain professional competency and a desire to be members in good standing in their respective professional associations (e.g., American Medical Association, American Academy of Family Physicians, Continuing Education Approval and Recognition Program of the Texas Nurses Association).

Site coordinators at each hospital verify attendance sheets of those present during TNT sessions. Attendance sheets are sent to TNT where they are permanently recorded and the necessary paperwork is completed to meet the verification requirements of the appropriate professional associations. This procedure is possible because TNT courses have prior approval from the professional associations. Ten contact hours in TNT courses is equal to one CEU (continuing education unit).

The decision to offer a continuing education course can be prompted by suggestion from a resource person in a university or hospital, input from needs assessment surveys conducted periodically by TNT staff, or student evaluations of current courses. Once a topic is chosen, the content expert or speaker who is scheduled to teach it is given complete responsibility for selecting and presenting the course material.

TNT staff have a strong commitment to providing students with study guides that include all the pertinent narrative, photo, chart, and graphic information they will need to learn the material included in the speaker's presentation. In addition to preparing study guides, the TNT staff distribute all the accompanying slides and videotapes to the sites.

## Faculty Roles

Credit courses are taught by The University of Texas at Austin faculty and continuing education courses are taught by content experts from the Health Science Center network hospitals, or from any location in the world. For example, live programs have in the past involved experts from Israel, England, and France. The expert, or speaker, determines the course content, teaches the course on the network, and selects any accompanying print or video materials.

Since many speakers are unfamiliar with teaching courses over an audio network, TNT staff hold special orientation sessions on the network to acquaint them with it. Speakers are taught not only about the mechanics of audio teleconferencing, but also about how to encourage an informal atmosphere that elicits student participation.

Most guest speakers and some local speakers do receive an honorarium. However, medical and dental schools view continuing education as a regular part of their academic role.

## Delivery System

Programs can originate from any of the 90 hospital sites in the network. Although all sites can hear everything that is presented on the network, participation in any specific program or course in an upcoming program they must register through their site coordinator with the TNT office. Once a participant is registered, study guides and the appropriate video materials will be sent to the site coordinator.

During telecourse sessions, participants interact with the speaker by pressing the bar on push-to-talk microphones. TNT staff encourage friendly informal interaction among speakers and participants before programs begin. This is one way of overcoming the reluctance of some participants to initiate comments or questions since they can be heard by everyone on the network. Even though attendance varies from 25 to 80 people per program, all questions seem to be answered; usually one person's question suffices for many people.

Site coordinators are appointed by each hospital on the network. Their duties include scheduling the room or rooms that are linked to the network, ensuring that the teleconferencing and video equipment is maintained and repaired, instructing participants in the use of equipment, distributing print materials, setting up videotape or like equipment, and sending attendance sheets to TNT staff in San Antonio.

## Enrollment

In 1981, TNT recorded over 60,000 student contact hours. Since many health professionals participate in more than one session and many listen without registering, it is not possible to obtain exact participation figures. The credit courses enrolled 100 students in the 1981-82 academic year.

## Administrative Structure

The Teleconference Network of Texas is a separate unit within The University of Texas Health Science Center at San Antonio that reports to the special assistant to the vice-president for academic services. Each professional group served by TNT has an advisory group that meets on the network to discuss its needs and to suggest new courses. TNT has five full-time and three part-time staff.

## Finances

The 1981-82 budget for the network is $325,000. Major expenses include telephone lease costs, equipment purchases, course development, and salaries. TNT is very close to self-sufficiency based on fees from network hospitals ($150 per month), income from course registration (which covers costs for study guides and video materials), and other sources.

- adjusting the program's operational and financial structure in response to changes in telephone company policies and rates
- coping with the high rate of turnover among telephone company personnel; TNT staff insist on proper maintenance of the circuit
- maintaining accurate mailing lists for site coordinators at 90 sites in order to ensure that print and video materials reach the correct location prior to the teleconference; mail slow-downs at holiday periods are a related problem
- getting faculty and speakers to prepare materials far enough in advance for TNT staff to prepare study guides and mail print and video materials to the sites

### Observations About Distance Learning

- most material important enough to be included on a slide or videotape during an audio teleconference should be included in the study guide for participants to take away with them
- there are many techniques faculty can employ to increase student participation in audio teleconference sessions
- in audio teleconference courses, the more involved (e.g., taking notes, being called on to answer questions) students are in the learning process the more they learn
- faculty orientation to the network is crucial to the success of an audio teleconferencing program

### Future Plans

- cooperate with other providers of medical continuing education to produce print and video materials for mutual benefit
- distribute print and video materials developed by TNT to other states' networks
- broaden TNT's offering of programs to cover all aspects of health care
- add more credit courses to the schedule, including graduate nursing courses

- increase the use of videotape
- explore further the use of cable television to supplement audio teleconferencing
- expand the financial base of TNT to ensure self-sufficiency

### Contact Persons

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Phyllis Wood, Program Coordinator
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## Resources Available

Catalog, schedules, site coordinators' guide, general inquiry package, forms used to report trouble, and course checklists.

# UNIVERSITY OF WASHINGTON, CONTINUING EDUCATION

## Telecommunications Program

WETNET (Washington Educational Teleconference Network) and Cablearn

## Educational Mission

The audio teleconferencing network WETNET is in the process of reexamining its overall mission. It currently provides a wide variety of public postsecondary and governmental agencies with a cost-effective means for sharing educational resources. Although no systematic information has been collected about participants' characteristics, most are out-of-school adults seeking credit for the one or two professionally related continuing education courses offered over the network each quarter.

Cablearn is attempting to provide continuing education programming for adults who are pursuing degrees, professional upgrading, occupational qualifications, vocational training, or avocational interests. A recent detailed survey of cable viewers by Cablearn revealed their average age is 45 to 54; most have some college education, and about one-third previously have enrolled in formal instructional programs beyond high school; most are either professionals, craftspersons, or retirees; most earn more than $25,000 per year; about equal numbers are men and women; the strongest area of curricular interest is business, followed by the social sciences; and most watch 6 to 10 hours of television per week. No information is available about the number who concurrently may enroll in on-campus courses.

## Telecommunications Technologies

WETNET is a two-way, live audio teleconferencing system that uses telephone lines (a four-wire dedicated line) to link 22 locations in Washington State. It can link at least two additional locations anywhere (i.e., in-state, out-of-state) as needed.

Cablearn is the operational arm of a consortium of 12 Seattle-area institutions and agencies that, through microwave technology, make available simultaneously to subscribers of three different cable television systems (Viacom, Teleprompter, and Liberty) educational programs that originate from the University of Washington.

## Curriculum

Of the 20 WETNET courses offered in 1979-80, 17 were in professional continuing education (e.g., nursing, real estate, library science), all originated from one of the state university campuses, and most awarded either regular or continuing education credit. Extensive use is made of audio-visual aids, including transparencies, tapes, and slides, in each of the WETNET field classrooms.

In contrast, in 1980-81, the first complete year of Cablearn operation, 80 percent of the 54 courses were leased from outside agencies. About half were offered for credit; of these, half were at the undergraduate and half were at the graduate level.

Cablearn offerings include continuing dental education, community college telecourses (humanities, business, science), staff development courses, teacher in-service courses, GED preparation programs, and senior citizen programming. About 20 percent of the programming is developed by the University of Washington and consists primarily of "between program" informational, promotional, and educational "spots." In 1980-81 it also included an international studies series.

## Faculty Roles

Most WETNET courses are based on existing on-campus courses and adapted to suit WETNET's purposes. WETNET staff provide training programs for faculty who will be teaching on the network and design these programs to meet the needs and interests of individual faculty members. Most faculty maintain telephone advising hours, and many maintain on-going correspondence with all members of a class. Staff meetings are held weekly over the network. Those involved include the part-time aides located at each field site, faculty members, and WETNET central staff. When campus budgets allow, some faculty may travel to one or more field sites during the term. Proposed courses are reviewed and approved by the Inter-Institutional Committee for Continuing Education, composed of deans and directors of continuing education for all state

### Noteworthy Features

*WETNET*

- operates a statewide audio teleconferencing system
- achieves considerable cooperation from other state institutions
- makes extensive use of audio-visual equipment in an audioteleconferencing system
- uses a marketing plan for network expansion and programming
- shares programming with other audio teleconference networks such as Alaska's legislative network

*Cablearn*

- cooperatively manages educational programming on three cable networks in Seattle
- involves a consortium of 12 institutions
- is using results of a recent survey to develop new programs targeted to five distinct audiences
- does not attempt to standardize programming support services across consortium institutions
- uses short "spots" between programs for special informational, promotional, and educational purposes
- encourages cooperation and reduces competition among institutions for programming time slots

### Problems Encountered

*WETNET*

- overcoming the continued reluctance of some institutions to participate in audio teleconferencing
- resolving some policy issues involving WETNET and individual institution programming jurisdiction in various regions of the state
- increasing citizen awareness and knowledge of WETNET

*Cablearn*

- addressing the need for more financial support to expand use of available on-air program time

### Observations About Distance Learning

*WETNET*

- WETNET students seem more university campuses.

Many Cablearn courses are selected by the Washington State Community College Telecommunications Consortium, a group of 11 colleges in the state. Individual campuses or groups of campuses sponsor Cablearn courses, and each, therefore, develops its (or their) own instructional and student services support system for the courses. No standardized support services are offered. Individual members of the Seattle Educational Access Cable Consortium, the guiding arm of Cablearn, bring forth programming proposals, which are reviewed by the Consortium program committee and scheduled by the Cablearn coordinator.

## Delivery System

WETNET's 22 sites include community colleges, four-year state institutions and educational service districts located throughout the state. Field sites consist of classroom facilities, most of which can accommodate 25 students, that are equipped with moveable tables and chairs and provide a minimum of four microphones and a variety of audio-visual equipment. Most courses are offered in 50-minute blocks, Monday through Thursday, from 1 to 10 p.m. Critical to the delivery system is the role of the field-based program aide, a learning facilitator, who assists with registration, takes attendance, distributes in-mail support materials from the instructor, and orients students to the system. Aides are selected by the WETNET coordinator and trained over the network by WETNET staff. Aides also work with an administrator affiliated with the educational organization representing the field site.

Cablearn cablecasts to more than 100,000 homes in the greater Seattle area on Mondays, Wednesdays, and Fridays from 4 to 10 p.m., using three different cable television systems. Support services provided to students vary, depending on the institutional course sponsor. The central Cablearn office, though, publishes and disseminates a monthly schedule guide to those who request it.

## Enrollment

In 1979-80, the first full year of operation after its founding in September 1979, WETNET enrolled 1,470 students at the then-available 10 field sites. Both the number of sites and the enrollment figures are expanding; about 3,000 students enrolled during the second year. Enrollment figures represent those completing the course. No retention information is available for WETNET courses.

Cablearn enrollment and retention information is not available. All such information is maintained only by the individual campus sponsor of the course(s). Cablearn first came on-air in January 1980, and the coordinator has observed that enrollments will increase only as the visibility of Cablearn courses increases.

## Administrative Structure

WETNET is administered by the dean of continuing education at the University of Washington and managed by the University of Washington Office of Media Systems. The full-time coordinator is supported by a full-time office assistant, a three-fourths-time program assistant, a half-time broadcast technician, a half-time office assistant in the Tri-Cities area in the southeast corner of the state, and part-time program aides at each field site. The program is advised by the Inter-Institutional Committee for Continuing Education, composed of the deans and directors of continuing education from state universities.

With Cablearn, "Cablearn" itself is the operational arm (scheduling and coordinating consortium activities), and the Seattle Educational Access Cable Consortium is the guiding arm of the overall system. The consortium consists of 12 Seattle-area institutions, and its representatives include directors of continuing education and media services from the University of Washington, Seattle Pacific University, six community colleges, the Seattle Public Library, the Group Health Cooperative, Seattle Public Schools, and Renton Vocational Technical Institute. The full-time coordinator, a half-time program assistant, and a part-time engineer are based at the University of Washington. The coordinator administers Cablearn and coordinates consortium meetings and activities. The consortium recommends projects that can be undertaken and suggests new directions for programming.

## Finances

In the long run, WETNET plans to become a self-sustaining program. Its current annual budget is about $100,000. For the last biennium, about one-third of the costs were paid from fees charged to instructional departments using the network, and surplus funds from Continuing Education at the University of Washington were used to make up the difference. For the current biennium, and for the first time, the state allocated funds directly to WETNET via Continuing Education at the University of Washington. Major WETNET expenses are salaries for central staff, equipment costs (phone lines, terminal charges, etc.), and costs for travel and promotional activities. All field sites pay classroom maintenance costs. WETNET students taking courses for credit are assessed fees on the same basis as those on-campus; the same is true for noncredit professional continuing education courses.

Initially, Cablearn was supported by a Title I, HEA grant. As of fall, the University of Washington, with state funds, will provide support to the system.

The Cablearn budget is about $35,000 annually and pays for central staff operations. No monies are collected from or exchanged among consortium members. Each member institution is responsible for arranging payment for leased courses or for supporting development of locally produced programs. With additional sources of revenue (i.e., gifts or grants), the coordinator is confident the system can expand its programming.

## Resources Available

WETNET—an information kit that describes how to design a teleconference program for WETNET; Cablearn—a monthly schedule and program guide and a descriptive brochure of Cablearn.

critical of program content than on-campus students

- faculty indicate students produce higher quality products (papers, exams) than on-campus students

*Cablearn*

- there are many more older cable viewers than had been predicted

## Future Plans

*WETNET*

- give more emphasis to promotion in individual communities in the state
- link smaller teleconferencing networks emerging in the state with the larger network
- explore the potential of business/industry service sites that combine audio and video technologies
- link with professional education sponsors in other state networks (Alaska, Montana)
- offer sequence courses leading to a B.A. degree
- purchase courses such as offerings for gifted high school students developed by the Kansas teleconferencing network TELENET
- expand the number of field sites

*Cablearn*

- expand both programming diversity and on-air time (to seven days a week and 18 hours per day)
- engage in more resource sharing with the newly formed Washington State Educational Cable Council, comprised of organizations with programming access to educational cable television channels
- increase efforts to inform faculty and staff about the potential educational uses of cable television

## Contact Persons

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# UNIVERSITY OF WISCONSIN-EXTENSION (UWEX)

## Telecommunications Program

Instructional Communications Systems (ICS)

### Educational Mission

The Instructional Communications Systems (ICS) unit at UWEX has responsibility for the management of three major interactive teleconference networks: the Educational Telephone Network (ETN), Statewide Extension Education Network (SEEN), and the Meet-Me Bridge network. In addition, the unit operates several specialized audio teleconference networks for state agencies. ETN, interconnecting 200 statewide sites, was created in 1965 by the Department of Postgraduate Medical Education of the University of Wisconsin Medical Center and UW-Extension after unsucessful attempts to use two-way radio for statewide medical educational conferences. Since 1969, 23 additional sites around the state have been equipped to provide line-drawn graphics as well as the audio conferencing capability. These sites constitute the Statewide Extension Education Network (SEEN). A third network called Meet-Me has been created to supplement ETN and SEEN.

The three major networks offer residents a combination of noncredit professional continuing education courses, public service programming, credit courses, and administrative services. Continuing education courses are offered in areas such as agriculture, business, education, engineering, law, and library science, as well as in legal, financial, and environmental issues of import to the community. Less than 5 percent of the total ETN/SEEN offerings are undergraduate and graduate credit courses in education, engineering, and music. ETN also is used to facilitate communication among UWEX administrators, faculty, and county agents on a regularly scheduled basis. ETN/SEEN provides interactive audio and audiographic instruction to over 36,000 participants each year. Data on the age, sex, and ethnic composition of this population are not readily available. Most participants range in age from 30 to 50, with many coming from small cities and rural communities. The average student is assumed to travel 3 to 10 miles to attend an ETN class.

### Telecommunications Technologies

ETN is a dedicated, four-wire audio teleconferencing network that provides UWEX with exclusive use of a system with better quality and more reliable service than regular telephone lines. SEEN uses two dedicated, four-wire telephone networks; one carries audio messages and the other transmits line-drawn graphics throughout the network. Each teleconference site is equipped with a Darome Convener that amplifies the incoming telephone signals so they can be heard by large groups. Students use tabletop microphones equipped with a press-to-activate switch. A control bridge located at the Madison campus and operated by a technician is the heart of the network. Anyone pressing and holding the microphone bar can be heard by participants at all other locations on the network.

Recently the SEEN electrowriter equipment, which permits transmission of line-drawn graphics, was replaced with a slow-scan/freeze-frame television system. Initially, this technology will be used in one direction only. Eventually all SEEN sites will be able to send as well as receive slow-scan programming. Slow-scan will allow the transmission of still pictures, including pictures of the instructor, students, charts, slides, models, etc. to all 23 SEEN sites. All equipment is standardized to ensure technical quality and to facilitate rapid repair. Repairs are handled by regional technicians and the Madison staff.

In addition to ETN and SEEN, ICS has established a Meet-Me Bridge network capable of linking any 20 telephone lines together for dial-up teleconferencing. This network is flexible enough to handle ad hoc sessions as well as regularly scheduled classes thereby taking some pressure off ETN and SEEN which are nearly saturated.

### Curriculum

Through ETN and SEEN, over 150 courses are offered each semester. The majority are professional continuing education and public service programs. Those few credit courses offered at the undergraduate and graduate levels are generally not readily available on all the campuses of the University of Wisconsin System. This is a deliberate policy designed to ensure that ETN and SEEN do not encroach on the academic offerings of the campuses. The content of the curriculum is determined by the faculty of the various departments of UWEX. In addition, each department prepares study guides and syllabi for students taking their courses. Students for whom network meetings are inconvenient can take some courses as Independent Learning Packages.

Some of theses self-contained courses include audio cassettes of faculty presentations along with print materials.

## Faculty Roles

University of Wisconsin-Extension itself is not a credit or degree-granting body. It operates within its own province; i.e., in continuing education and, cooperatively with the campuses, in the credit area. Many of Extension's 1,000 statewide faculty work closely with the teleconferencing networks, either as instructors, program coordinators, or local site facilitators. Some of these faculty hold joint appointments with the UW System campuses. Other instructors are hired from the private sector as adjunct instructors.

Faculty can conduct their classes from any site in the network, including the central studio and control facilities in Madison. Classes can be conducted entirely live, or the instructor may use a short audiotape followed by an interactive audio discussion. The instructional format may include a wide range of techniques intended to capture and maintain the interest of network students (e.g., interviews, case studies, student reports, buzz groups, panel discussions, role playing, brainstorming, etc.) Printed handouts often are used at the sites. Individual faculty also may assign teaching assistants to serve as local content experts at the sites. Some instructors conduct group tutoring on the network in addition to the class. Other faculty set up telephone office hours for advising and tutoring. When possible, faculty attempt to meet personally with students at various sites in the network.

Numerous audiotapes and videotapes, as well as workshops, one-on-one counseling, and print materials are used to train faculty to use ETN and SEEN. The emphasis is on personalizing presentations, encouraging student interaction, keeping the format varied, and getting feedback.

## Delivery System

ETN and SEEN make it possible for a faculty member in one location to simultaneously teach small or large groups of students scattered all over the state. At each site a local program administrator assists students in becoming familiar with the teleconferencing equipment and the process of learning at a distance. In some cases a teaching assistant, appointed by the instructor, also will be present at each site. The network sites include University of Wisconsin campuses, courthouses, libraries, and hospitals. ETN classes often are supplemented by print materials distributed to registrants or to the various sites by the sponsoring UWEX department. Currently, ETN and SEEN operate 15 hours a day. ETN is on the verge of being saturated because of the high demand for its services. The Meet-Me Bridge network has the advantage of being able to connect regular telephones for either administrative purposes (two-thirds of its use) or instruction (one-third).

Technically, all the teleconferencing networks operated by ICS can be joined at the control point in Madison to expand statewide coverage.

## Enrollment

Approximately 36,000 participants were enrolled in ETN and SEEN programs in 1980-81. Data or completion rates for network programs are not available.

## Administrative Structure

ICS is a unit within University of Wisconsin Extension that has statewide responsibility for providing and coordinating communications systems for the efficient delivery of learning opportunities. The concept of "taking the university to the people" reflects a strong philosophical and organizational commitment that has evolved in Wisconsin since the beginning of this century. Consequently, at the county and community level, there is an administrative structure composed of district directors and local program administrators and aides who help make the teleconference network function. The director of ICS has a staff of 18 full-time and 10 part-time employees.

### Noteworthy Features

- constitutes the largest and most complete telephone-based educational delivery system in the United States
- serves a very large number of sites (200) spread across the state, thereby offering equal educational access to all citizens
- is a low-cost delivery system that allows extensive interaction among faculty and students
- saves time and money for both faculty and students because they are not required to travel long distances or spend large blocks of time away from their occupations.
- benefits from the commitment of Extension faculty to outreach efforts; thereby reducing the need to overcome faculty resistance to the use of technology to reach distance learners
- has designed a delivery system that is capable of being adapted to other settings at various levels of magnitude and sophistication
- has since its founding in 1965, pioneered in developing the technology and pedagogy of educational applications of audio teleconferencing

### Problems Encountered

- finding enough time on networks to accommodate demand
- anticipating opportunities and problems posed by new technological developments and finding the resources to adapt a large system to them
- developing pedagogical strategies (and the logistical mechanisms to support them) capable of gaining and maintaining the interests of learners participating at distant locations

### Observations About Distance Learning

- audio teleconferencing can be used effectively for instructional purposes when sufficient care is taken to (a) humanize the system by creating an informal environment, (b) make plans for encouraging user participation, (c) design the message style to suit the content and the audience, and (d) gather feedback from participants

### Future Plans

- explore the various ways to use freeze-frame videoconferencing and other sophisticated audiographic approaches to provide visual information on the SEEN network

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### Finances

The overall budget for ICS is approximately $637,000 per year. It is composed of a General Purpose Revenue (GPR) and Program Revenue budget, to cover costs of the delivery systems. The budget is partially supported by internal sales to UW-Extension departments. Major expenses include telephone line charges, staff salaries, and capital equipment. Budget figures for ICS do not include the time of UWEX faculty who teach programs or the staff at the district and local levels who assist in network administration.

### Resources Available

Some University of Wisconsin-Extension teleconferencing publications include: TELECOMS Newsletter (issued eight times annually), *Teleconferencing and Interactive Media, More Than Meets the Eye, Bridging the Distance, Technical Design for Audio Teleconferencing, A Design for Interactive Audio, Teletechniques—A Handbook, Dial Access: A Way to Spread Your Message.* Videocassettes include: *Twelve Interactive Techniques for Teleconferencing, No Place for Lone Rangers, Electronic Meetings: Options for Communications, Communicating Through Computers* and *Where The Interaction Is.* Conferences and workshops on interactive media are held each year.

# WAYNE STATE UNIVERSITY

## Telecommunications Program

University Studies and Weekend College Program (US/WC)

## Educational Mission

The University Studies and Weekend College program (US/WC) at Wayne State University was created in October 1973 to provide educational opportunities designed specifically to meet the needs of working adults. In view of the special problems faced by working adults who often have to reconcile work, family, and community responsibilities with the time, place, and curricular constraints of colleges and universities, the founders of US/WC designed the program with certain assumptions in mind:

- The working adult is fundamentally different from the student just out of high school.
- In order for the university to be available to working adults, an educational delivery system must be designed to bring education to the student rather than vice versa.
- The life experience and intellectual needs of working adults require the development of a new curricular structure.
- An innovative delivery system and curriculum require an appropriate organizational structure.

The resulting US/WC program has, over the years, served thousands of working adults. The majority (over 55 percent) are males in their late twenties to early forties (the average age is approximately 37, with 75 percent over 29 years) whose income levels average around $20,000 and who work in blue-collar or middle-lower level service jobs in the Detroit area. The majority are enrolled as full-time students at US/WC while working full-time in industry at the same time. Before financial support was phased out by the state of Michigan, US/WC also served numerous students at the Jackson State Prison.

## Telecommunications Technologies

US/WC uses public broadcast television to deliver television courses to its students. Much of the original video production for the over 900 half-hour videotapes produced by US/WC was completed in the studios of a commercial broadcast television station, which donated its facilities for this purpose. Recently, US/WC began using an ITFS channel to supply its programming to several suburban cable systems. The telephone is also used for some student/faculty interaction.

## Curriculum

The US/WC curriculum is designed to respond to the learning processes of working adults who have had considerable life experience. It attempts to build linkages between the student's life experience and the educational concepts that normally are associated with university education. It does this by providing an interdisciplinary treatment of three traditional curricular areas: social science, humanities, and science and technology. The US/WC faculty are divided into three interdisciplinary groups around these curricular areas and offer a full year's coursework in their respective areas. Students are given the option of choosing which of the three they will concentrate on in their first, second, and third years. Within each curricular area are interdisciplinary focal points around which the classes are organized.

For example, if a student chooses social science for his or her first year of study, each quarter he or she will take a television course (two and one-half hours of video per week), a workshop course (a four-hour weekly seminar), all addressing the same interdisciplinary focal point. One quarter the focal point will be ethnic studies, the next work and labor, and the third international and domestic conflict. (A fourth quarter on theory and method of the social sciences is usually taken in the fourth or fifth year.) Each of the three courses is worth four credit hours (12 per quarter), so if the student completes three focal points in one year (nine months), he or she accumulates 36 credits. After completing the first three years, referred to as the "lower-division curriculum," the student takes the advanced curriculum, which includes 36 hours of electives and 36 hours of theory and method and advanced studies; together these constitute the fourth and fifth years. It is possible to complete the curriculum in

### Noteworthy Features

- serves as the original model for the To Educate the People Consortium
- offers an interdisciplinary curriculum and a delivery system designed specifically to enable working adults employed full-time to be full-time students in a bachelor's degree program that can be completed in four to five years.
- succeeds in attracting blue-collar workers to a university baccalaureate program
- provides opportunities for course registration and career and academic counseling at learning sites in or near worksites
- has individual faculty members integrating material and evaluating the performances of a single group of students in three interrelated, four-credit courses each quarter
- uses television to deliver the major portion of the content of four-credit hour courses
- develops television courses that are integral components of a complete bachelor's degree curriculum rather than a collection of individual courses developed on a course-by-course basis
- offers blue-collar workers the opportunity to continue in their work or consider career changes; two years after graduating, 52 percent had applied to graduate school and nearly all had been accepted by an institution of their choice

### Problems Encountered

- challenging inflexible Veterans Administration policies on financial aid for veterans taking non-traditional curriculum
- adapting the program to the special circumstances (e.g., illness, shift changes, death in family) of adults who are full-time workers and full-time students with little flexibility in their personal schedules
- defining new roles for disicipline-based faculty members teaching in an interdisciplinary program

with blue-collar workers as students

- convincing the university administration and faculty tenure committees that US/WC faculty need to be evaluated in terms of the roles they actually perform (e.g., teacher, counselor, advisor, advocate, etc.) rather than in terms of traditionally defined faculty roles
- reconciling discrepancies between services the university normally offers its students (e.g., gym, clinic, campus newspaper, social events), which working adults do not use, with those services that working adults need (e.g., personal advocate, transportation, day-care), but which the university does not provide
- learning how to recruit working adults in their employment and community settings

## Obvservations About Distance Learning

- if given the opportunity to pursue higher education on a full-time basis, many working adults will make the time and financial sacrifices necessary to achieve a bachelor's degree, whether or not they plan to change careers
- working adult students appreciate the convenience of television courses transmitted into their homes
- open-broadcast television courses should not be offered as the only type of instruction for working adults, because these adults want to discuss the material and interact with peers and faculty
- working adult students seem to care much more about the quality of the resource person(s) on a television course segment than they do about the sophistication or quality of the technical production
- if an educational program is not sufficiently rigorous, working adult students suspect they are wasting their time
- 40 percent of the graduates (mostly blue-collar workers) indi-

four years by attending during summers.

Within this curriculum the television course is seen as a convenient vehicle for reaching working adults in their homes with basic information, concepts, and facts, along with a wide variety of interpretations. The series host (or on-camera instructor) serves as an interface between the video content (e.g., interview, panel, film) and the students viewing at home. The host does this by raising questions and making comments that working adult students might be expected to ask. Formats vary depending on the subject, the instructor, and the objectives of the particular segment; they include combinations of lectures, discussions, exposition of nonverbal material (e.g., paintings, photographs), and presentation of experiential events or performances.

Each television course includes 55 half-hour segments (five per week). Sessions are generally taped live in studios, employing minimal extra production techniques in order to keep down costs. Students are provided with a study guide for the entire series. Examinations and any related written or experiential assignments connected with the television course are handled by the workshop instructor, who also evaluates student performance for the workshop and conference courses during the same quarter.

## Faculty Roles

US/WC has its own full-time faculty whose sole responsibility is teaching in the program. Some part-time faculty are hired in response to short-term enrollment fluctuations. The faculty has been centrally involved in the original design and evolution of the US/WC program. Because faculty work within an interdisciplinary curricular and organizational framework, they must be willing to expend extra effort to learn from their colleagues in other disciplines and to learn to relate to working adults who often have no prior college experience.

In a given quarter, a faculty member will be responsible for teaching a four-hour workshop each week and integrating into it material from the television course and the two weekend conferences. In addition, it is his or her responsibility to test and evaluate the students for all three courses in that quarter. Class size for the workshops is usually between 15 to 20 students, thus allowing the faculty member to evaluate the students effectively. A normal teaching load includes two separate workshop classes per quarter.

Many US/WC faculty have been involved in the design and production of television courses and the accompanying study guides. In some cases they have served as on-camera hosts or as experts interviewed by the hosts.

## Delivery System

The delivery system reflects the uniqueness of the US/WC curriculum. In order to provide full-time working adults with the opportunity to attend college on a full-time basis, the program had to make best possible use of whatever time the students could free themselves from work, family, and community responsibilities.

The television courses are offered over a combination of public broadcasting and commercial television stations every weekday morning and evening and then repeated again in the weekends, thus giving working adults easy access to important curricular material while maintaining contact with the program and pacing themselves in their studies. The four-hour workshops are held at a convenient time each week in a facility close to the worksite (e.g., union hall, library), thus reducing the need for students to travel long distances. The two weekend sessions that constitute the conference course occur in eight-hour blocks on consecutive days twice during each quarter. The conference course, which includes all currently enrolled students, represents an attempt to explore, indepth, current problems related to the theme of inquiry for that quarter. Activities include lectures, panel discussion, simulations, films, and dramatic presentations. During these weekend sessions, students periodically meet with their workshop faculty member to discuss the materials covered.

In addition to having face-to-face access (on campus and at workshop and conference sites) to faculty and counselors, students are able to enroll in the program and register for classes at or near their worksites. Special opportunities for cultivating writing skills and participating in experiential learning activities (e.g., foreign travel) are also available to students.

## Enrollment

Since the inception of US/WC in 1973, over 10,000 students have taken one or more courses and over 1200 have graduated. Enrollment during 1980-81 averaged about 850 students per quarter. Data on completion rates are not available.

## Administrative Structure

The US/WC program is the only unit within the College of Lifelong Learning at Wayne State University offering a full degree program (bachelor of general studies). Tenure recommendations for US/WC faculty are initiated by a committee of US/WC faculty with final decisions made by the provost of the university. US/WC includes 40 full-time faculty and 20 full-time advising and administrative staff.

## Finances

US/WC operates on the basis of income from tuition. The overall annual operating budget is approximately $1.7 million. Faculty and staff salaries constitute the major program expenses. Broadcast television time is contributed by the local public broadcast station.

## Resources Available

*UNESCO Evaluation of the Wayne State University's University Studies and Weekend College Program, To Educate the People: An Experimental Model for Urban Higher Education for the Working Adult,* other articles and descriptive material.

cate no changes in career expectations

- working adult students report positive changes in the attitudes of their children toward education after having a parent in US/WC program; this is especially true among blacks and students who have taken many courses

## Future Plans

- publish results of an extensive study of graduates and the children of graduates
- continue to encourage replication of the US/WC model by other institutions through the To Educate the People Consortium

## Contact Persons

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# WEST VIRGINIA COLLEGE OF GRADUATE STUDIES (COGS)

**Noteworthy Features**

- integrates audio teleconferencing and television into the curriculum of a highly decentralized, statewide graduate program
- combines audio teleconferencing, broadcast television, videotapes, and cable television in the same courses
- provides access to library resources (through a statewide computerized catalog) for graduate students who are learning at a distance from university campuses
- has the flexibility to offer graduate courses for as few as 10 students dispersed across a 16-county region of West Virginia
- obtains access to television courses at no cost through participation in a statewide instructional television consortium

**Problems Encountered**

- using video courseware in West Virginia, where the terrain often interferes with open-broadcast television and cable television penetration is still at a very modest level
- absorbing the high costs of leasing long-distance telephone lines for audio conferencing in an area where students are so widely dispersed
- getting faculty accustomed to preparing written materials at the beginning of the course rather than prior to each class session
- coordinating all the logistics associated with a decentralized statewide educational delivery system

**Observations About Distance Learning**

- vigilant coordination and monitoring can help minimize the consequences of technical problems, but it cannot eliminate them
- responsibility for coordination and monitoring technical aspects of program operation should not be left up to faculty, because their motivation to participate in the program might diminish

## Educational Mission

West Virginia College of Graduate Studies was created by the West Virginia Board of Regents as an autonomous institution to meet the diverse educational needs of state residents for convenient access to graduate education. COGS does not have a campus of its own. It is a decentralized institution that makes use of five satellite learning centers at existing colleges or universities as well as numerous other permanent and temporary sites around the state (i.e., public libraries, high schools, industries). Most COGS courses are taught by faculty in classrooms at one of the five satellite learning centers.

In an effort to make the COGS curriculum even more flexible and convenient for working adult students, telephone and television technologies are being utilized in the form of audio teleconferences and television courses (telecourses) to deliver some instruction. Within COGS these are referred to generically as teleconferencing courses, and rather than being treated as a separate delivery mode they are integrated into the overall COGS delivery system.

Because the audio conferencing and video technologies are incorporated into a broad cross section of courses, students in these courses generally conform to the COGS' student profile: their average age is approximately 32, 62 percent are women, and over 99 percent are West Virginia residents. A majority are public school personnel who are required by the state to earn six hours of graduate credit every three years.

## Telecommunication Technologies

Audio teleconferencing is conducted over four-wire and two-wire telephone lines and leased from the telephone company. Ten sites are permanently connected by four-wire lines. Additional sites are temporarily connected by two-wire lines as they are needed. COGS also uses the facilities of two public broadcasting stations and some cable television operators. Videotapes are available for viewing by students at their convenience. Toll-free telephone lines are used for routine student/faculty interactions.

## Curriculum

COGS offers courses in four curricular areas: behavioral studies and humanities, business and management education and engineering and science. Most of the courses that use the audio conferencing and video technologies are in subjects such as education, counseling, psychology, business, and English. In the 1980-81 academic year COGS offered 15 courses designed to use these technologies, in the 1981-82 academic year 18 courses were offered. In some cases (e.g., bad road conditions in the winter) other COGS courses are taught over the teleconferencing facilities on an ad hoc basis. The television courses incorporated into COGS curriculum are acquired through the Higher Education Instructional Television Consortium, which collaboratively leases courses for 20 West Virginia colleges and universities. Since many of these telecourses initially were designed by their producers as undergraduate rather than graduate courses, COGS faculty and staff use them as educational resources to which they may add wrap-around video materials, additional print materials, face-to-face weekend workshops, or audio teleconferences. COGS currently does not produce any video courses of its own.

## Faculty Roles

Both full-time COGS faculty and adjunct faculty are involved in teaching teleconference/telecourse courses. Whether or not they involve the use of telecommunications technologies, all COGS courses go through the same review and approval procedure. Faculty responsibilities include preparing print materials and examinations to supplement the video and print components of telecourses, conducting teleconference class sessions, and maintaining mail and phone contact with students. Written assignments are mailed to faculty, who subsequently return them to their students with comments.

## Delivery System

COGS is gradually moving away from offering quite so many face-to-face classes and is increasing its use of audio teleconferencing. Currently courses are offered at the five satellite centers and at as many as 20 permanent and temporary sites in high schools, public libraries, industrial, and other community sites. Telecourses can be seen at learning sites by students during group viewings or on an individual basis. Cable subscribers can view the programming in their homes. Each site is managed by a teleconference aide who has responsibility for assisting the students in the use of the teleconferencing and video equipment and for ensuring the security of the equipment when it is not in use.

Since each of the five satellites is at an existing college or university, COGS students have ready access to library resources. Those students who cannot get to one of the satellite centers can have books mailed to them directly. A statewide library network, computer-based catalog, and on-line research literature data base make it possible for distance learners in any part of the state to have the advantage of research facilities. COGS, therefore, has been able to offer courses that require literature reviews and research papers. Textbooks can be secured by mail from bookstores. Students can also register for all COGS courses by mail.

The size of the average COGS class is 12. When fewer than 10 students sign up, the course may be offered on an independent-study basis.

## Enrollment

Enrollment in COGS courses that regularly use audio teleconferencing and television courses was 548 in 1980-81 and 712 in 1981-82. The completion rate is greater than 90 percent.

## Administrative Structure

Courses that use teleconferencing and television are integrated into the overall COGS administration rather than being treated separately. Responsibility for the management of these courses is shared by four different deans.

## Finances

Because the use of telecommunications is so highly integrated into the operation of this decentralized institution, it is not possible to come up with one overall budget figure. However, it is clear that the costs of delivering these courses is more expensive than traditional COGS classroom courses on a per student basis. This is due, in part, to the small classes, so designed to serve COGS's outreach mission. Major expenses include leasing telephone lines, printing, and postage.

## Resources Available

Internal evaluation report.

- a face-to-face orientation session might help overcome initial student confusion about what is expected of them as distance learners
- part-time adult learners have many family, job, and community responsibilities competing for their time; these often lead to incomplete or late assignments and a higher drop-out rate
- adult learners seem more questioning and less tolerant of poor quality instruction than younger students
- adults learning at a distance are often much more assertive with faculty than those who are physically present in the same classroom

## Future Plans

- offer courses to the inmates and staff at a federal women's prison
- increase the number of cable television companies participating in the network
- explore the possibility of using satellite networks to serve COGS students

## Contact Person

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# WEST VIRGINIA WESLEYAN COLLEGE

### Noteworthy Features

- has pioneered in the development of audio cassette learning packages for distance learning
- delivers instruction to learners on campus and in remote rural areas at low cost
- gives students the opportunity to pace themselves by replaying segments of the course material at their convenience

### Problems Encountered

- broadcasting SCA radio band signals in the mountainous West Virginia terrain
- working within the financial limitations of a small private institution
- supporting the costs of providing educational options for distance learners

### Observations About Distance Learning

- distance learners tend to prefer a degree-oriented program to an unconstructed schedule of elective courses
- distance learners tend to be very highly motivated
- distance learners tend to reenroll for more distance learning courses

### Future Plans

- produce two or three new or revised courses a year
- expand promotional efforts to include college-bound high school students
- lease additional courses developed by other institutions
- develop procedures enabling other institutions to lease Outreach
- develop a degree-oriented program
- achieve self-sufficiency in the near future

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## Telecommunications Program

Outreach Education Program

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## Educational Mission

The Outreach Education Program at West Virginia Wesleyan College is intended to make high quality, self-paced audio courses available to those who wish to begin, augment, or complete their college education while studying away from campus. Even though the courses are designed with this purpose in mind, approximately 80 percent of the Outreach Education enrollees are concurrently enrolled in one or more on-campus courses. In addition to serving on-campus students at West Virginia Wesleyan College, the Outreach Education Program has served working adults (12 percent), unemployed adults (7 percent), and full-time students on other campuses (1 percent). Enrollment of on-campus students results from overcrowding of certain popular courses or schedule conflicts. Many more off-campus than on-campus students are female (nearly two-thirds), and two-thirds are in the 17 to 35 age category; one-third are older than 35.

## Telecommunications Technologies

The Outreach Education Program provides instruction through audiotape cassettes of course lectures and coordinated print materials. Students must have access to a standard audio cassette tape recorder. When the audio program of Outreach Education began in 1976, it was broadcast over the SCA (Subcarrier Communications Authorization) radio band. The radio broadcast technology was dropped in 1980 because of signal interference caused by the state's mountainous terrain, and West Virginia Wesleyan College turned to mailed audio cassette packages. The audio cassette program was initiated in the summer of 1981, after course packets were reviewed and revised.

## Curriculum

The Outreach Education curriculum offers foundation and middle-level undergraduate liberal arts courses in such subjects as English, music, art appreciation, history, religion, and psychology. Both two- and three-credit courses are available through the Outreach Education Program. For example, a typical three-credit course includes 24 forty-minute taped lectures. In 1979-80, the program offered 15 courses. The Outreach Education Program has produced all but one of the courses it has offered. The one exception was acquired from Purdue University Up to now, other institutions have leased Outreach Education courses on a very limited basis, but the program is currently developing a formal leasing procedure.

Outreach Education audio cassette packets provide the student with everything needed to complete the course: taped lectures, coordinated student manual assignments, study aids, visual aids, tests, and auxiliary materials such as textbooks, lab kits, art prints, or special listening records. All materials are either written or selected by faculty and Outreach Education staff.

## Faculty Roles

Once a curricular area is chosen for course development, faculty are centrally involved in the designing, writing, and taping process. A faculty committee reviews progress throughout the course development process. New courses are usually produced within a one-year schedule, and course revisions generally take six months. Once a course is developed, faculty members are responsible for grading class assignments and exams, conducting review classes, and communicating with students by phone or letter.

## Delivery System

Once students receive their audio cassette packet and print materials, they have 12 weeks to complete the course. Students mail homework and exams to the faculty and discuss any questions or problems by telephone during scheduled faculty office hours.

## Enrollment

From 1976-80, Outreach Education radio courses enrolled 1,005 students during the 12 semesters they were offered, for an overall average of about seven students per course. In the 1981-82 academic year the program enrolled 270 students in audio cassette courses. Approximately 11-14 such courses are offered each semester.

### Administrative Structure

When the audio broadcast program began in 1976, supported by an HEW grant, Outreach Education operated as an independent program of the college. When the grant ended, the college institutionalized the program by placing it in the Education Media Services Department, which also provides a variety of audio-visual services, operates the campus radio station, and, through the Outreach Education section, also produces public relations programs for the college. The Outreach audio cassette program now functions with one full-time coordinator.

### Finances

The original radio program course development costs were funded by a Federal AIDP grant (Advanced Institutional Development Program). The College underwrote the costs during the nine months of 1980-81, when the program was revamped. The program expects to recoup those costs and become self-supporting in the near future.

The basic equipment needed to establish an audio studio costs about $16,000 in 1981 dollars, not including installation. At West Virginia Wesleyan College it costs approximately $2,500 to produce a new three-credit course consisting of 24 forty-minute lectures. That cost covers the salaries of the instructor, producer, and typist as well as the cost of master reel and cassettes.

### Resources Available

Psychology course (for lease), guidelines for producing Outreach programs, sample production implementation schedules, and various brochures, flyers, and other in-house materials.

### Contact Person

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# WISCONSIN VOCATIONAL, TECHNICAL AND ADULT EDUCATION SYSTEM AND THE WISCONSIN FOUNDATION FOR VOCATIONAL, TECHNICAL AND ADULT EDUCATION, INC.

### Noteworthy Features

- reaches on a statewide basis, learners with low levels of previous educational attainment
- uses television to convey both GED and vocational/technical curricula to new groups of learners; 70 percent of GED and 30 percent of technical course students have never before enrolled in VTAE courses
- has been successful in attracting underserved learners into GED preparation courses
- fosters cooperative linkages among a variety of local, state, and federal agencies that support the program (CETA, Department of Education-FIPSE, Department of Education-Vocational Education, the State Board, the foundation, local districts, etc.)
- provides, at the state level, educational resources that are used in a variety of different ways at the discretion of the local vocational/technical schools
- generates new communication linkages between the vocational/technical schools and the social service agencies and organizations in the state that serve similar clientele

### Problems Encountered

- acquiring a base level of support to carry the program through its initial first three years
- establishing a stable, continuing funding base where, ultimately, districts will be asked to support course production costs
- coordinating and equally involving a wide variety of agencies in the program
- overcoming initial resistance to instructional changes by some faculty members
- obtaining sufficient lead time to deliver programs after funds for program acquisition or development are received and before they must be spent
- maintaining close communication between individual districts and the system's office staff
- obtaining sufficient access to air time in the statewide public television system

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## Telecommunications Program

Technical School of the Air

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### Educational Mission

The Technical School of the Air seeks to increase adult resident access both to the GED program and to quality vocational/technical education courses. The program, begun in spring 1980, continues to develop its services and expand its clientele. Students enrolled in the GED program are likely to be individuals with no previous experience with the state system of vocational/technical institutes; many (about one-third) are low-income, CETA-eligible adults, and a significant number are unemployed (28 percent). The average age is about 29 to 30. Accurate information is not yet available about enrollees in the two vocational/technical courses offered thus far. (Refer to the Administrative Structure section for a description of the organizations involved in the Technical School of the Air.)

### Telecommunications Technologies

The school uses the statewide public television network and its affiliate stations, which cover 80 percent of the state, to broadcast video-based courses. Videotapes are used extensively. Thus far, limited use has been made of both closed-circuit and cable television by the local vocational/technical districts. However, cable usage is expected to increase quite rapidly.

### Curriculum

Technical School of the Air uses video technologies as the central delivery mechanism of some courses and as a supplementary resource in others. An example of the former is the GED preparation courses. It is a telecourse, produced by Kentucky Educational Television (KET) and Cambridge Book Company, combining video segments, which are broadcast over public television, and print materials included in a student study guide and textbook. With this approach to the use of video, students work almost exclusively on their own at home, but do have telephone contact with a course monitor.

In the case of the vocational/technical courses, the video component is used to supplement a more varied learning experience that includes classroom and laboratory sessions at local technical schools, study guides, texts, laboratory manuals, suggested and required readings, and telephone conversations with faculty. For these courses, students may view the video materials at home (over their PBS station) or on videotape at their local technical school or at one of its outreach centers (e.g., high school, library). Examples of such courses include basic electricity and DC circuits, basic electricity and AC circuits, and marketing perspectives. Although these courses offer both the student and the faculty more educational resources, the electricity courses require face-to-face meetings for laboratory sessions, which do impose time and place constraints on distance learners. The electricity courses are being used both as part of an A.A.S. degree in electronics and as an industrial training program sponsored by business and industry.

### Faculty Roles

With coordination from the Wisconsin System of Vocational, Technical and Adult Education, faculty from the various education districts are highly involved in identifying curricular needs that might be met by the School of the Air and reviewing programs that either might be acquired or developed locally. System staff organize and conduct several television workshops for faculty each year as well as several special workshops designed to review current curricula materials used in the districts. Local district faculty, particularly those involved with the GED program, devote considerable time to telephone follow-up with GED enrollees. Orientation sessions are held for all district faculty involved with School of the Air courses. Faculty also evaluate the strengths and weaknesses of course management procedures used in their districts.

### Delivery System

An extensive publicity effort preceded the initial offering of the GED course. Many agencies (the Wisconsin Educational Television Network; the Educational Communications Board; the Wisconsin Board of Vocational, Technical and Adult Education

(VTAE), and individual vocational/technical education districts) played key roles in building initial public awareness for the program. Posters and leaflets were individualized for each district and distributed extensively to strategic locations such as CETA offices, community centers, grocery stores, and worksites.

Each district employs an individual to monitor the progress made by the home-based TV GED students; students are individually contacted by the course monitor at least one to three times per term to discuss progress. Other forms of contact between students and monitors vary greatly by individual district.

For the GED course, two half-hour programs are shown during evening, daytime and Saturday time slots each week and are repeated up to three times each week. Program tapes are available in district libraries. Broadcasting the courses over television serves two purposes: it delivers the courses to the general public, and it delivers the courses to technical institutes and high schools for off-air dubbing. After tapes have been made off-air, they are used in a variety of ways, including local rebroadcast or cablecast, on-site placement at business and industries, and competency-based supplements to classroom instruction. Delivery to educational institutions via broadcast is possible only with courses for which off-air dubbing rights can be acquired. Such rights were acquired for the AC-DC courses, and, as a result, over 150 copies of these courses are being used by technical institutes and high schools in Wisconsin.

Students in the vocational/technical courses attend classroom and laboratory sessions on campus. They can view the video segments on public broadcast television, on videotape on campus, or at outreach centers or worksites. Each of the 16 vocational/technical education districts is responsible for program implementation (i.e., registration, materials distribution, instructional support, testing, and group meetings with instructors).

## Enrollment

The initial GED course enrollment was 1,081 in spring of 1980, as of the fourth week of the term. Altogether, 72.4 percent completed the course and, by November 1980, almost one-third (351) had completed the GED. From spring of 1980 through fall of 1981 enrollment in the GED preparation course totaled over 2,900. In some districts about 50 percent of the GED students have successfully completed the GED examination and have earned equivalency certification two months after completing the KET/GED course. In spring of 1981, the DC circuits course attracted 150 students (about 65 percent completed the course), and the marketing course enrolled 171 students (about 77 percent completed the course). Not all schools offer the courses each semester because local districts can choose whether or not to participate in the Technical School of the Air.

## Administrative Structure

Three key organizations facilitate efforts by the 16 local districts, part of the statewide vocational/technical education system, to extend access to adult education and vocational/technical courses. (1) The state public broadcasting system mobilizes local affiliate stations to broadcast courses that are part of the Technical School of the Air. (2) A nonprofit foundation, the Wisconsin Foundation for Vocational, Technical and Adult Education, Inc., is used to facilitate the solicitation and receipt of gifts and grants to support the use of TV courses. (3) Finally, the Wisconsin System of Vocational, Technical and Adult Education coordinates the course planning and program delivery. Each local district is responsible for providing direct instructional support and for tailoring School of the Air programs to district needs. The tripartite support structure allows for maximum cooperation statewide, while maintaining the tradition of strong local control of adult and vocational/technical education in the state.

## Finances

The program has relied most heavily on multiyear funding from the Fund for the Improvement of Postsecondary Education (FIPSE). The FIPSE dollars have played an instrumental part in attracting additional sources of support to the program. Major sources of support attracted include FIPSE, CETA, individual districts, and vocational

## Observations About Distance Learning

- there is a very high interest in the GED program, evidenced by those who have never been attracted to a post-high school program
- it is possible to offer an effective GED program using television as the primary delivery mode
- there is a need for carefully planned local promotion and course management by district personnel
- GED program participation and completion rates vary greatly across districts
- video-based vocational/technical materials can be used to deliver training to outreach centers and worksites; there appears to be a growing need among employers and employees for such services

## Future Plans

- expand course acquisition and production
- cooperate with agencies outside the state to produce new vocational/technical courses
- expand use of cable and low-power television
- market course materials nationally through the foundation (currently occuring with the AC-DC circuits and marketing courses)
- continue to solicit special gifts and grants for use with course acquisition and production efforts
- expand use by high schools of the vocational/technical courses
- expand on-site delivery at business and industrial locations

**Contact Persons**

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education. The funds support individual course projects. Local districts contribute additional support by paying for the local instructors affiliated with the TV courses; they also arrange for access to cable television in some areas of the state. Key support staff include two full-time staff members who serve with the foundation and one full-time coordinator for the School of the Air. Other members of the Wisconsin Board of VTAE provide additional administrative and staff support to this effort. Each district contributes the time of support service staff affiliated with the local vocational/technical institute.

## Resources Available

A preview package from the foundation for the DC circuits and AC circuits, courses, and the marketing course; *Final Report, Providing Remedial Basic Skills Via Television,* available from the state board. Those interested in reviewing the GED program are invited to contact the system office to arrange for a site visit.

# WNET/THIRTEEN, NEW YORK CITY

## Telecommunications Program
Educational Division

### Educational Mission

WNET/Thirteen is the major Public Broadcasting station in the New York City metropolitan area. For over 20 years staff at WNET have cooperated with educators in the region to provide instructional television programming and teacher training. More recently (1978) WNET established a higher education service that works in cooperation with regional consortia and individual colleges and universities to produce and broadcast television courses aimed at adult learners. Since responsibility for these higher education activities at WNET has changed somewhat as a result of reorganization, the more inclusive term "Educational Division" will be used in this description to refer to those staff at WNET who manage these activities.

Since the mid-1970's the Educational Division staff at WNET have been involved in encouraging the development of collaborative efforts involving educators and broadcasters in the greater New York metropolitan area. The Tri-State Consortium, which recently has evolved into the 47-member Eastern Educational Consortium (EEC), was one such effort. In another collaborative effort WNET and a group of seven public and private, two- and four-year colleges worked together as an informal consortium to deliver courses under grants from the Fund for the Improvement of Postsecondary Education (FIPSE). Currently WNET works primarily with the EEC. (A full description of the EEC is included in this book.)

WNET's higher education efforts have focused on working adults for whom traditional college courses are not always convenient or appealing. In cooperation with area colleges, unions, and employers, WNET-produced television courses have been offered to secretarial and clerical workers at Prudential Life Insurance Company, municipal employees who are members of the AFSCME union, blue-collar employees at the Bronx Post Office, New York state nonprofessional psychiatric workers, and senior citizens. Most of these working adults have been women (approximately 65 percent) in their late twenties and early thirties. In addition to serving the working adult population, WNET courses are designed to appeal to the general public broadcasting audience.

### Telecommunications Technologies

WNET and the college and universities with which it cooperates use public broadcast television and video cassettes to convey the video portion of their courses. Telephones also are used for student/faculty interaction.

### Curriculum

WNET has focused on introductory courses in the humanities and social sciences. It has progressed through the following phases in clarifying its pedagogical approach: (1) surveying the existing telecourse market, adapting British Open University (BOU) courses, and offering these adaptions in a nonbroadcast mode at off-campus centers; (2) producing for broadcast an original and revised version of "An Introduction to the Humanities," also a BOU adaption; (3) developing, producing, and testing (with City College of New York students) the first three pilots for "The American City' course; (4) developing study guides and new projects to meet the needs of postsecondary learners in and outside the classroom.

All these courses have relied heavily on self-study texts as well as on high quality video production. In keeping with its early experimentation with British Open University courses, WNET-produced courses include fewer video segments than many American television courses. For example, the BOU adaption courses include approximately nine half hours of video, the "Introduction to the Humanities" course included 13 half hours, and "The American City" course will, when completed, include 15 half hours of video. However, as part of its current working relationship with the EEC, WNET does broadcast courses produced by others that include as many as 26 to 30 half hours of video.

WNET also emphasizes the importance of developing student writing skills in the process of teaching courses that involve television. The humanities course includes

### Noteworthy Features

- uses the resources of major public broadcasting station to serve lower level blue- and white-collar workers with little or no previous collegiate experience as well as traditional continuing education adults
- uses television to enrich and supplement regular classes taught in convenient community and worksite locations
- integrates a basic writing skills component into a distance learning television course
- experiments with different approaches to designing curriculum and integrating television into distance learning delivery systems
- involved educators in long-term efforts to organize educational consortia in New York and surrounding states; the Eastern Educational Consortium is an outgrowth of such efforts

### Problems Encountered

- achieving satisfactory ongoing working relationships between a large public broadcasting station and the numerous educational institutions in a metropolitan area
- balancing a television station's commitment to serve the educational needs of its general audience (which, for the most part, already enjoys the benefits of higher education attainment) with those of working-class adults who have less educational attainment and generally only represent potential WNET viewers
- trying to experiment with alternative roles for television in distance learning within the financial realities of a television station already committed to competing within a large urban market with high labor costs and a sophisticated viewing audience
- adult learning programs based in television stations have little control over student support services offered by participating colleges

an additional two-credit-hour component that teaches writing skills by using humanities content-related assignments. WNET is also developing "The Writing Project" which is designed to teach writing as a process of learning.

### Faculty Roles

With telecourses broadcast over WNET and offered through the EEC, individual colleges assume responsibility for faculty assignments. With regard to courses and print supplements developed by WNET, faculty content experts are centrally involved in both the design and delivery of materials. Originally, WNET worked with colleges and secured faculty through release-time arrangements. Distinguished faculty serve as advisors to review and assist on all projects. When this proved unsuccessful, the station secured faculty through contract or institutional codevelopment arrangements. Distinguished faculty serve as advisors to review and assist on all projects.

WNET has stressed regular classroom meetings and a strong role for the instructor in courses that it has developed and offered. WNET courses have also stressed basic skill development, particularly writing. Working with participating colleges, WNET has held precourse workshops with faculty to discuss pedagogy and to review materials.

### Delivery System

WNET has been involved in two different approaches to the delivery of television courses. The informal consortium activities funded by FIPSE used the video segments of the courses as a supplement to regular classes held in off-campus learning centers, worksites, or in campus classrooms. Currently, in cooperation with EEC, WNET broadcasts video segments of telecourses that may require students to attend a few on-campus orientation and examination review classes but not regular weekly sessions.

In both cases the extent of student support services accompanying the course varies considerably from one college to another. Probably one of the most complete offerings of support services has been those provided for federal employees by the City College of New York at the Federal Plaza Building. CCNY staff waived some admissions criteria, simplified registration procedures, offered special orientation and placement testing sessions, and made personal counseling and academic advising readily available.

### Enrollment

Enrollment in WNET-produced courses has been modest; less than 500 students since the program began in 1978. The courses developed to date have been focused primarily on experimentation with different designs and delivery formats rather than on increasing the number of students. The student completion rate for the courses offered through the informal consortium has been approximately 85 percent. Data on completion rates for EEC institutions are not yet available.

### Administrative Structure

Higher educational activities at WNET/Thirteen are managed through the Education Division. Previously they were the function of the Office of Higher Education, but, through administrative reorganization, ongoing activities are now being handled by Education Services and Learning Resources. Individual projects in development are handled through subdepartments (e.g., The American City or The Writing Project) with their own staff and are administratively accountable to division officers assigned to manage the project. The Education Division has 16 full-time employees and varying numbers of consultants and persons working on discrete projects.

### Finances

The Education Division for 1981-82 has an operating budget of $3 million. Of this, 20 percent goes to higher and continuing education activities. Since 1978, WNET has received a number of development and production grants including: two two-year grants from FIPSE, the first for $210,000 and the second, a joint grant to the station and the City College of New York, for $215,000; a production grant from the National Endowment for the Humanities for "The American City" of $275,000; and combined grants totaling $223,000 for "The

Writing Project." The $100,000 expense for the production of "An Introduction to the Humanities" was borne by WNET. A small income is derived from tuition reimbursements from some of the participating colleges and sale of print materials. Major expenses include production and staff time for course design.

## Resources Available

"The American City"—three programs and instructor/student guides for: "City Aflame," "Women in the City," and "City Within a City"; "An Introduction to the Humanities"—study guide and evaluation.

- copyright and format problems make it very difficult to use previously produced noninstructional television materials for educational purposes
- financing course development activities in the face of diminished federal funding

## Observations About Distance Learning

- distance learning courses can be designed flexibly enough to serve both working adults with little previous college and traditional adult learners
- working adults seem to prefer the structure of the traditional classroom, with its faculty and peer interaction, to learning entirely on their own, even if it requires more time and effort on their part (e.g., viewing video segments).
- traditional adult continuing education students (with a profile similar to the average PBS viewer) are less interested in attending regular classes (in addition to watching television segments) than are the working adults with lower levels of previous educational attainment

## Future Plans

- play a more active role in local consortial arrangements
- continue to produce television-based courses that appeal to a broad general audience and distance learners alike
- develop eight one-hour video segments plus text and study guide for a new course entitled "The Brain"; this series, conducted in cooperation with W.H. Freeman Publishing Company is funded by the CPB/Annenberg Project

## Contact Person

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# WYES/CHANNEL 12, NEW ORLEANS

## Telecommunications Program

OPPORTUNITY: A Program for Women

### Educational Mission

OPPORTUNITY: A Program for Women was established in September 1977 to serve as an information and counseling resource for women in the greater New Orleans area as well as throughout southern Louisiana and western Mississippi. Over a three-year period (1977-80), WYES aired 36 hour-long programs designed to provide the area's women with information and encouragement to consider entry or reentry into postsecondary educational programs. Lack of sufficient funds currently is preventing continuation of the OPPORTUNITY program.

### Telecommunications Technologies

The OPPORTUNITY program used the public broadcast television facilities of WYES and the radio facilities of Tulane University FM station (WTUL) to serve its clientele. During the first two years the programs were simulcast over the FM station for Spanish-speaking viewers who could watch television with the sound turned off and the radio on. The program also made extensive use of telephones for call-in questions during and after the broadcast.

### Curriculum

Since the OPPORTUNITY program was not designed as a course, the term curriculum is not entirely appropriate. However, the program did provide systematic treatment of educational and career issues that affect women and was, therefore, intended as a learning experience. Some of the early shows focused on such topics as financial aid, family adjustments encountered when women return to school, local community agencies that offer support services, study skills, and how to understand academic terminology. Some programs targeted particular populations, such as mature women from lower-income backgrounds, and others focused on career development skills, such as job hunting, self-evaluation and researching employers.

An advisory committee composed of representatives of postsecondary institutions in the area assisted the OPPORTUNITY staff in identifying issues of concern to women and in selecting program topics and identifying resource people.

### Faculty Roles

Various resource persons from area postsecondary institutions and social service agencies usually appeared as panel members during each program. These resource people and the OPPORTUNITY staff would answer questions phoned in by viewers during and after the program.

### Delivery System

The hour-long programs were aired once a month in prime time. They usually began with a prerecorded video vignette that provided an overview of the specific topic under consideration. Following the prerecorded segment, a panel of resource persons would participate in a live discussion of the topic and respond to questions phoned in by viewers. A bilingual counselor was at hand to answer or translate questions coming from Spanish-speaking viewers. Telephone lines were kept open after the show so that guest panelists and staff members could respond to questions.

During the first two years the program was simulcast over an FM radio station for Spanish speakers. The last year this procedure was discontinued, and a Spanish language version of the monthly television program was videotaped and replayed at a later time. Videotapes of OPPORTUNTIY programs also were made available to community groups on request. In addition to the televised programs, some special workshops on selected topics were held at the studio.

OPPORTUNITY staff also conducted extensive mailings to individuals and organizations, informing them of upcoming broadcasts and other related community activities. They also developed and disseminated a resource guide to area colleges and universities. The telephone information, counseling, and referral services of the program extended beyond the television programs into the regular work week.

## Enrollment

It is difficult to ascertain how many New Orleans-area women watched the OPPORTUNITY series. The program's regular mailing list, however, exceeded 4,000 women by September 1980. Most of the names were collected when viewers called into the studio with information and counseling requests. In addition, some 1,200 local-area women's organizations, counseling centers, and programs received copies of OPPORTUNITY's monthly promotional brochure on upcoming program topics. During the three years of programming, OPPORTUNITY's staff received over 3,700 phone inquiries and made over 500 referrals to area universities, colleges, and other educational organizations.

## Administrative Structure

WYES-TV is a public broadcasting television station, and the OPPORTUNITY program was operated as part of the station's regular programming. An advisory committee comprised of local postsecondary education officials assisted program staff in identifying program topics and in setting up the overall format of the program. The program staff included a project director, an assistant, a bilingual counselor, and a secretary.

## Finances

The program was funded largely by a three-year grant from the Fund for Improvement of Postsecondary Education (FIPSE). WYES community support augmented the grant to some extent. The OPPORTUNITY program's budget was $111,000 in the first year of operation, $100,000 in the second, and $80,000 in the third year. Since FIPSE support terminated in September 1980, WYES has been seeking financial support for continuation of the OPPORTUNITY program that will have a greater focus on career development and preparation. The major project expenses were the salaries of the project staff, production, and promotion.

## Resources Available

FIPSE Report

## Noteworthy Features

- used open-broadcast television to provide educational and career counseling resources to women considering entry or reentry into postsecondary education
- combined prerecorded video segments with live panel discussions and telephone call-in opportunities in the same program
- maintained a telephone information and referral service during and following television programs
- offered bilingual services to Spanish speakers during and after televised programs
- enjoyed considerable support from local colleges and universities

## Problems Encountered

- failing to attract enough learners to the Spanish language simulcast versions of OPPORTUNITY programs broadcast on FM radio
- failing to obtain sufficient financial support to continue the program beyond FIPSE funding

## Observations About Distance Learning

- television can be used effectively to provide information, counseling, and referral services
- the availability of telephone information and counseling services greatly enhanced the impact of the OPPORTUNITY program
- local educational institutions are willing to provide substantial support for a neutral information, counseling, and referral activity

## Future Plans

- raise sufficient funds to continue the televised programs and the counseling and referral services
- focus any future programs more on career preparation, including information on specific employers and industries in the area

## Contact Person

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# GLOSSARY OF TECHNICAL TERMS

**Audio teleconferencing**
interactive audio communication between individuals or groups at three or more locations. Audio teleconferencing may be conducted over either two-wire or four-wire telephone circuits.

**Bandwidth**
the spread between the highest and lowest frequencies a communications channel is capable of carrying. Broadband technologies like television use wide bandwidths with a capacity as high as 6 million cycles per second or 6 megaHertz. Narrowband technologies like telephone require much less bandwidth and operate closer to 3000 cycles per second or 3 kiloHertz.

**Broadband**
communications channels that are capable of carrying a wide range of frequencies. Broadcast television, cable television, microwave and satellite are examples of broadband technologies. These technologies are capable of carrying a great deal of information in a short amount of time, but are more expensive to use than technologies like telephone which require less bandwidth.

**Broadcast**
transmission of information in one direction that is available to an undifferentiated audience.

**Bridge**
a device used to link three or more telephone lines into a conference call.

**Cable television**
a broadband transmission system which has the capacity to deliver multiple channels of programming to residential and institutional subscribers over a coaxial cable. Technologies such as satellite, microwave, and fiber optics can also be used as parts of a cable television system.

**Cable television (two-way)**
a form of cable television technology which permits viewers located at two or more specially equipped sites to be seen and heard by participants at the other sites. Interaction can be further facilitated by using split screen video images of participants at different sites.

**Cable television (viewer-response)**
a form of cable television technology that allows the viewer to use a keyboard to respond to forced-choice questions posed by an instructor or moderator located at the point of program origination. Viewer responses are tabulated by a computer for use by the instructor and for display on the television screen.

**Closed-circuit**
a communications system in which signals are transmitted to specific receivers rather than to the public at large. Closed-circuit systems can be created by using microwave, cable or telephone technologies.

**Computer-Assisted Instruction (CAI)**
a system in which the student receives individualized instruction by interacting with a computer terminal. The computer is programmed to guide the student through a series of instructional materials. The computer can be used to supplement traditional classroom instruction or as an alternative to the classroom. In either case it not only allows students to proceed at their own pace, but also enables faculty to deal with students on a one-to-one basis both on and off the computer.

**Computer-Based Instructional Management (CBIM)**
a term used to describe computer applications which address both management and instructional activities equally, rather than focusing exclusively on one or the other. Students served by CBIM systems learn away from the computer and receive feedback in the form of written messages. CBIM systems are designed to be used by faculty for any course or level of instruction. As a result faculty can use CBIM systems to provide students with feedback at a number of different academic levels. CBIM systems can also be used for student advising and counseling.

**Computer-Managed Instruction (CMI)**
a system of managing instruction in which the computer is used for tasks such as student record keeping, selection of instructional materials, scoring tests, interpreting results and monitoring student activities. Students learn away from the computer and receive feedback in a written form.

**Dedicated system**
a communication channel which is reserved for the purpose of providing a single service. Both the telephone lines that are used for most statewide audio teleconferencing systems and educational access cable television channels are examples of dedicated systems.

**Dial-access**
a combination of audiotape and telephone technology that permits the caller to access audiotapes on a variety of subjects. Dial-access systems can be controlled manually by an operator or automatically by special equipment which selects the tape on the basis of coded number entered via the telephone (with touch-tone phones). The information is usually of a public service nature (e.g., health, personal enrichment, etc.) but, in some cases, it is used for instructional purposes.

**Direct broadcast satellite (DBS)**
a communication satellite designed specifically to transmit video signals directly to small rooftop receiver systems owned or leased by those of the general public who subscribe to such a service.

**Downlink**
transmission of signals from a satellite to receiving equipment on the ground.

**Earth station**
the antenna and electronics used to receive signals from a satellite or to transmit signals to a satellite for distribution to other sites on the earth.

**Electronic blackboard**
a telephone-based technology which is capable of transmitting hand-drawn graphics between different

locations. When the instructor writes on an electronically sensitive blackboard the writing appears in the distant location on a television monitor. If the students at the remote location also have an electronic blackboard the result is an interactive exchange of graphic and audio information. Voice communication between locations is made possible by an additional telephone line.

**Facsimile**
a method of transmitting printed or graphic material over telephone lines by converting it to electronic signals at one location and then reconverting it into print or graphic form at the other location.

**Four-wire circuit**
a special circuit that is used to improve the quality of telephone transmission by allowing participants at different locations in an audio teleconference to talk and be heard simultaneously. Regular telephone service available to the public uses two-wire circuits.

**Freeze-frame television**
like the term slow scan television, it refers to a technology that captures still frame pictures and displays them on television monitors. The term freeze-frame is sometimes used to describe systems in which the image is "frozen" in a fraction of a second rather than requiring the subject to be motionless for many seconds. See slow scan television.

**Instructional Television Fixed Service (ITFS)**
television channels that have been set aside by the Federal Communications Commission for nonprofit educational uses. In order to receive this broadcast television programming a receiving site must be equipped with a special antenna.

**Interactive technologies**
those technologies that permit at least some form of two-way communication (visual, voice, or written) between two or more individuals. In some cases a combination of two or more technologies may be used to achieve interaction. This term also is used in this book to refer to electronic print conversations between students and computers (e.g. Computer-Assisted Instruction).

**Low-power television**
a technology that uses transmitters that have historically been used to amplify and rebroadcast television signals. These transmitters have generally been used to serve rural communities distant from the point of origination. An FCC ruling in 1980 authorized the licensing of such stations to originate programming for distribution to areas of approximately 10-20 miles. Few licenses have been granted to date but many thousands of applications have been filed.

**Meet-Me Bridge**
a type of bridge that allows participants to gain direct access to a telephone conference by dialing a specific number. This eliminates the need for one operator to initiate calls to all participants, a process that can be time consuming for everyone involved.

**Microwave**
high frequency signals used to communicate from one point to another. See point-to-point microwave.

**Narrowband**
communications channels that are capable of using a narrow range of frequencies. Telephone is an example of a narrowband technology which requires less bandwith than a technology like television. Less bandwidth means less capacity to convey information in a given amount of time; it also means lower costs to the user.

**Narrowcasting**
electronically transmitting information to a specified audience rather than the general public. Video programming transmitted to a specific professional group such as dieticians is an example of narrowcasting. Cable television is a technology that readily lends itself to narrowcasting.

**Noninteractive technologies**
technologies that, when used alone, permit communication in one direction only. (e.g., open broadcast television, radio)

**Point-to-point microwave**
high frequency signals used to transmit programming (audio, video, data) from one location to another. When both locations use microwave transmission equipment, interactive programming can occur.

**Radio talkback**
a microwave technology that uses frequencies at the high end of the ITFS band to transmit voice communication from remote sites to the point of origin in an ITFS network. This technology is generally less expensive than telephone when used beyond a small geographical area.

**Slow-scan television**
a telephone-based technology that captures still frame pictures and displays them on television monitors. Unlike the full-motion video programming we see on our television sets at home, slow scan video does not constantly update the image. Because the image may be changed only a few times every minute, it can be transmitted over narrow-band telecommunications channels. This reduces the cost of using video technology in those instances when full-motion is not necessary. Freeze-frame television is a term that also is used to refer to this technology. See freeze-frame television.

**Speakerphone**
a telephone in which the message is amplified so that the listener does not need to hold a telephone receiver.

**Subsidiary Carrier Authorization (SCA)**
special FM radio frequencies approved for certain uses by the Federal Communications Commission. This technology, which is used by many to provide radio reading serves for the visually handicapped, is available because FM radio transmitters can broadcast numerous programs at the same time. By encoding programming broadcast over some frequencies, and by equipping listeners with special receivers that decode the information, it is possible to serve special populations

at relatively low costs without interfering in regular FM programming.

**Teletext**
a one-way broadcast video technology that reaches a television set in the same manner as a standard television broadcast signal. Teletext delivers computer generated data in text and graphic form into the home using the television set as the display screen. Some teletext systems, which offer viewers services such as news bulletins and closed captioning for the hearing impaired, are noninteractive. Others, offering a wider range of information, allow the viewer to use a handheld keypad to select specific pages of text and/or graphic information. Such systems are sometimes referred to as "interactive" but, in fact, the viewer cannot interact with the computer generating the data at the point of origination. See videotex.

**Transponder**
a portion of a communications satellite that has both receiving and transmitting capacity. When activated by the reception of a specific signal (e.g. from an earth station), it automatically responds by transmitting that signal to one or more other locations on earth equipped to receive it.

**Two-wire circuit**
regular telephone service uses two conductors; as opposed to specialized four-wire circuits most often used for audio teleconferencing.

**Uplink**
transmission of signals from the ground to a satellite for subsequent distribution to other earth stations.

**Videodisc**
a thin plastic disc that resembles a phonograph record and can contain both audio and video information. From an educational perspective, the most promising types of videodiscs are those that use a beam of light to read the information. With this technology the educator is able to control the speed of the video frames, access any of the many thousands of potential still frames within seconds, use two separate audio tracks, and link the videodisc to a microcomputer.

**Videotex (or videotext)**
both spellings of this term are used to refer to the process of delivering computer generated data in text or graphic form into homes using the television set as the display screen. Unlike teletext technology which does not permit the viewer to interact with the computer, videotex is interactive. By using a keyboard the viewer is able to send word as well as numeric messages to the computer, thereby opening up a wide range of options. In addition to gaining access to various prepared lists of general interest information the viewer might retrieve information from data banks or even engage in computer-assisted instruction. Linkages between videotex and personal computers are also possible. See teletext.

**Video teleconferencing**
interactive communication among individuals or groups at three or more locations. At a minimum it includes audio in both directions and video in one direction. Two-way video, in addition to two-way audio, is most often referred to as video teleconferencing even though one-way video is more common. A variety of technologies can be used alone or in combination to achieve video teleconferencing. The video can be full-motion, or slow scan.

## Appendix A

# SURVEY METHODOLOGY AND SELECTION CRITERIA

Constructing a representative or random sample of a known universe of educational programs that use electronic media would have been the preferable way to design an inquiry of this magnitude and complexity. Unfortunately, the field is so new and dynamic that the nature and extent of it were largely unknown. Merely identifying, much less describing in any detail, all the postsecondary educational programs using telecommunications technologies would require an extremely ambitious effort, the outcome of which might be informative but not necessarily very enlightening. We decided it would be best to strike a balance between breadth and depth of coverage in order to achieve the desired level of understanding.

In the absence of an existing list of programs, we chose a few variables that seemed to assure the selection of a reasonably representative portfolio of educational programs upon which to base the inquiry. They included: type of organization, educational mission, clientele served, telecommunications technology, and geographical distribution.

One of the more difficult tasks was finding programs to include in the survey. In the effort to locate potential programs we relied heavily on references in current literature and presentations at various professional conferences. In addition, we depended heavily on referrals from professionals knowledgeable about and/or active in the field who knew where there were programs that might fit our criteria.

Once we identified a program, it was compared against the selection criteria before being included in the survey. Those programs that were selected had to satisfy *one or more* of the following criteria:

- a program with a delivery system or curriculum that is marketed nationally to postsecondary educators
- a program with features that could be readily adapted by others (e.g. a low-cost technology, flexible curriculum)
- a noteworthy or unique approach to a specific educational mission (e.g. vocational/technical education, homebound learners, working adults, rural populations)
- a noteworthy or unique application of one or more technologies
- a noteworthy or unique approach to solving the problems of managing the delivery of education at a distance (e.g. cooperation in the production or acquisition of courseware, involving faculty in course design and delivery, providing effective support services for learners, serving large geographical regions)

In addition programs had to meet certain minimum requirements to be included. They had to:

- be in operation for at least one full year before being interviewed for the study
- provide at least some support services to learners in addition to providing the telecommunications programming
- offer at least two or more courses at a time (this applied to instructional programs only)
- have the capacity to benefit other organizations by sharing resource materials and/or information concerning program practices

After selecting a program for inclusion in the survey, we conducted a structured interview of one or more of the program's staff. The interview was normally conducted by telephone but, in approximately 20 percent of the cases, we conducted interviews during site visits to the sponsoring organizations. A copy of the interview schedule is included as appendix C.

In all cases program descriptions were written by the author or consultants hired by the Center for Learning and Telecommunications. The descriptions were then forwarded to the staff to be reviewed for accuracy and completeness. In a few cases, portions of the descriptions were rewritten by program staff. Thus, each description (in an unedited form) has been reviewed and approved by the individual listed as contact person or his or her designated representative.

## Appendix B

# RATIONALE FOR EMPHASIZING PROGRAMS WITH A CAPACITY TO SERVE LEARNERS OFF CAMPUS

In the process of deciding how to narrow the scope of this inquiry, perhaps the most difficult issue was determining the extent to which the survey should focus on educational activities on or off campus. Because the purpose of the study was to describe ways educators use telecommunications technologies to serve learners, it was relatively easy to ignore those applications of the technologies used to solve problems of educational administration (e.g. computer processing of college financial records).

Consistent with that principle, but much harder to articulate, was the decision to focus on programs with a capacity to serve learners off campus. While the Center for Learning and Telecommunications is also clearly concerned with programs that serve on-campus students, (e.g. closed circuit television classrooms, computer centers), for purposes of the survey, such programs were excluded for a number of reasons.

First of all, transcending distances between faculty and students seemed to us to be the most appropriate educational application of telecommunications technologies. Secondly, we assumed that most educators were already familiar with on-campus applications of the technologies. In addition, the problem of serving students who are able to regularly attend classes on-campus did not seem to require as much attention as the challenge of extending educational resources to learners for whom frequent attendence on the college campus is either inconvenient or impossible. The vast majority of surveyed programs not only have the capacity to reach students off-campus, but also serve large proportions of on-campus students who need flexible scheduling options or prefer learning by such modes.

## Appendix C

# INTERACTIVE AND NONINTERACTIVE TECHNOLOGIES: SOME ADVANTAGES AND DISADVANTAGES FOR THE LEARNER

### Noninteractive Technologies[1]

**(e.g., broadcast television and radio, audiotape)**

**Advantages**

- They are familiar and nonthreatening.
- Learning can most often occur in the home.
- Replays of programs are usually available.
- Viewing or listening can be done alone or with groups of self-selected peers.
- Telecommunications component is usually supplemented by considerable student support services (e.g., field trips, review sessions).
- Instructor can usually be contacted before or after course sessions by telephone or mail.
- Learners are exposed to people, places, events, and ideas from far beyond their local environment.

**Disadvantages**

- Learner cannot ask questions of instructor or make comments during the course sessions.
- There is no immediate feedback from faculty.
- Lack of structured involvement with other students during the delivery of course sessions reduces learning via peer interactions.
- Viewing or listening times may not be convenient because of limited available broadcast or cable time.
- Prerecorded programming is not easily updated; it may not be current.
- A high level of motivation is required by faculty and student to maintain contact by telephone or mail.

### Interactive Technologies (noncomputer-based)

**(e.g., telephone, audio and video teleconferencing, two-way interactive cable)**

**Advantages**

- Learners can make comments and ask questions of instructor during the course sessions.
- Immediate feedback is available from the instructor during course sessions.
- Faculty often prepare their presentations more carefully than for regular classes.
- Opportunities exist for interaction with peers during course sessions.
- Course sessions usually occur in convenient community facility (e.g., library, worksite).
- Current material is easily integrated into live, interactive programming.
- Learner can interact with local, regional, national, and even international content experts.

**Disadvantages**

- Technology may be unfamiliar.
- Course sessions are structured and somewhat formal.
- Learners may be intimidated by the prospect of speaking over a live network to faculty and other students.
- Some learners may monopolize interactive conversation.
- Opportunities for individual students to ask questions or make comments may be reduced as the size of the group increases.
- Faculty may not know how to elicit participation by students.
- Course sessions are time bound, and, even if available, videotape or audiotapes can not duplicate the live interactive experience.
- Available time slots for course sessions may not be convenient to learners, especially on a busy network.

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[1] This treatment of noninteractive technologies assumes they are used alone, not in combination with interactive technologies like the telephone.

## Interactive Technologies (computer-based)

### (e.g., computer-assisted instruction)

**Advantages**

- Individualized treatment matches curriculum to student's ability level.
- There is immediate individualized feedback for the student.
- Instruction is self-paced.
- Instruction is nonthreatening after initial orientation, especially for learners with previous negative educational experiences.
- Instruction can be readily updated.
- Often there is more time available for additional faculty/student interaction.
- Print, graphic, and even audio communication can be combined.
- It is possible to interface with other technologies (e.g., videodisc, videotape, audiotape, videotex).
- Information counseling and referral, as well as instruction is possible.

**Disadvantages**

- Hardware is not always available in off campus settings.
- Software is often not available for postsecondary curriculum.
- Software is often not easily transferable from one type of hardware to another.
- Considerable orientation to the system is often necessary.
- Hardware and software problems can discourage student.
- Software may not be flexible enough to adapt to a wide range of learners.
- Access to computer terminal may be limited because of competition among students.

## Appendix D

# SURVEY QUESTIONNAIRE

This questionnaire consists of a series of basic questions which varied in their exact wording and order depending upon the nature of the program and the availability of print materials about it.

In most cases it was unnecessary to ask all these questions because many were answered in whole or in part by existing print materials about the program.

In 80 percent of the cases the interviews were conducted over the telephone. The remainder were conducted as site visits.

I. **Organization**
What is the name of the sponsoring organization(s)?

II. **Telecommunications Program**
Do you have one or more distinct programs that use telecommunications technologies to serve students?
What is the name of the program(s)?

III. **Administrative Structure**
What is the relationship between the sponsoring organization and the telecommunications program?
Are there other organizations or programs with which you cooperate in offering the program?
What kind of a governance arrangements exists among cooperating organizations and programs?
How many full-time and part-time faculty and staff are involved in the program?

IV. **Educational Mission**
What is the educational mission of the program?
What type of clientele does it serve?
What is the average age of learners?
What percentage of learners are male? female?
Does the student population have any special social, economic, or ethnic characteristics?
What percentage of students are enrolled concurrently in on-campus and off-campus courses?

V. **Telecommunications Technology**
What technologies does your program use to serve learners?

VI. **Curriculum**
What type of curriculum does your program offer?
How many courses did you offer in the last academic year?
Do you develop your own instructional materials? If so, how is this done?
Do you acquire instructional materials from other organizations?
What mix of electronic media, print media and classroom instruction is used in the courses you offer?

VII. **Faculty Roles**

What roles do your faculty play in the selection and development of instructional materials?
What roles do they play in delivering instruction?
What roles do they play in providing support services to students?
Does your program primarily rely upon full-time or part-time faculty?
What strategies does your program employ to encourage faculty involvement?

VIII. **Delivery System**

How does your program reach the students?
What on-campus and/or off-campus facilities are involved?
What support services are available to students?
What types of opportunities are available for students to interact with faculty and peers?

IX. **Enrollment**

What was the enrollment for your program in the past academic year?
At what point in the semester or quarter are these figures recorded?
What is the completion rate of your program?

X. **Finances**

What is the overall operating budget of your program?
What are your major expenses?
What are your major sources of income?

XI. **What aspects of your program do you feel are most noteworthy?**

XII. **What problems have you encountered? In the past? In the present?**

XIII. **What are some of the things you feel you are learning about the process of serving learners with telecommunications technologies?**

XIV. **What future plans do you have for your program?**

XV. **What resources (instructional materials, evaluations, guidebooks, etc.) do you have available for others interested in learning more about your program?**

XVI. **Who is the contact person for inquiries about your program?**

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